STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

Contents . . . August 23, 1937

Volume 101 - No. 8

Reader Comments 11
As the Editor Views the News 15
Wage Problem Impedes Steel Buying by Railroads 17
China and Japan Negotiate for Steel 18
Weirton Workers Demonstrate Against CIO and NLRB 19
Metalworking Machinery Exports 62 Per Cent over 1929 21
Steelworks Operations for the Week 22
First Half Pig Iron Output Shows Strong Gain 22
Men of Industry 23
Obituaries 24
Activities of Steel Users and Makers 25
Financial News of the Steel Industry 25
Meetings 26
Heavy Steel Products Gain 27
Mirrors of Motordom 29
Windows of Washington 33
How Synchronize School Output with Job Market?—*Editorial* 35
The Business Trend—Charts and Statistics 36
Automatic Gas Carburizing of Ring Gears 38
Manufacture of Chilled Car Wheels 42
Materials Handling 49
Welding, etc.—*Robert E. Kinkead* 57
Surface Treatment and Finishing of Metals 58
Progress in Steelmaking 62
Power Drives 68
New Equipment Descriptions 70
Recent Publications of Manufacturers 76
Market Reports and Prices 77-96
New Construction and Incorporations 97
Index to Advertisers 104

ABC

EDITORIAL STAFF

E. L. Shaner, Editor
E. C. Kreutzberg, Development Manager
A. J. Hain, Managing Editor

Associate Editors

E. F. Ross — J. D. Knox
G. H. Manlove — J. A. Cronin
W. L. Hammerquist — F. E. Gooding

NEW YORK
B. K. Price — L. E. Browne

PITTSBURGH
D. R. James

CHICAGO
W. G. Gude

DETROIT
A. H. Allen

WASHINGTON
L. M. Lamm

LONDON
Vincent Delport

BUSINESS STAFF

G. O. Hays, Business Manager
R. T. Mason, Circulation Manager
C. H. Bailey, Service Manager

NEW YORK
E. W. Kreutzberg — B. C. Snell

PITTSBURGH
S. H. Jasper — D. C. Kiefer

CHICAGO
L. C. Pelott — W. F. O'Dell

CLEVELAND
R. C. Jaenke

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. **Copyright 1937 by the Penton Publishing Co.**

ABP

Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, O.
John A. Penton, *Chairman of Board;* **E. L. Shaner,** *President and Treasurer;* **J. R. Dawley and G. O. Hays,** *Vice Presidents;* **F. G. Steinebach,** *Secretary.*

BRANCH OFFICES

New York ..... **220 Broadway**
Chicago ..... **Peoples Gas Building**
Pittsburgh ..... **1650 Koppers Building**
Detroit ..... **1010 Stephenson Building**
Washington ..... **National Press Building**
Cincinnati ..... **418-420 Sinton Hotel**
San Francisco ..... **2413 Milvia St. Berkeley, Calif., Tel. Berk. 7354-W**
London ..... **Caxton House Westminster, S. W. 1**
Berlin ..... **Berlin, N. W. 40, Roonstrasse 10**

A Metal that Meets ALL *your Needs*

FLASHER PAN FOR SALT CRYSTALLIZATION

This oddly shaped pan is electrically welded from Monel sheet. It stands a pressure test of 30 p.s.i. The interior had to be made smooth and to stay smooth. The plates were veed from the inside and welded from inside. Result: it passed all tests, and the surface was perfectly uniform.

To Do This Job Well . . . MONEL Uses These Properties

1. Has high strength and stiffness to prevent distortion from internal pressure (tested to 30 lb.).

2. Hardness to resist wearing action of salt crystals.

3. Rust proof to insure production of quality salt that is pure and white.

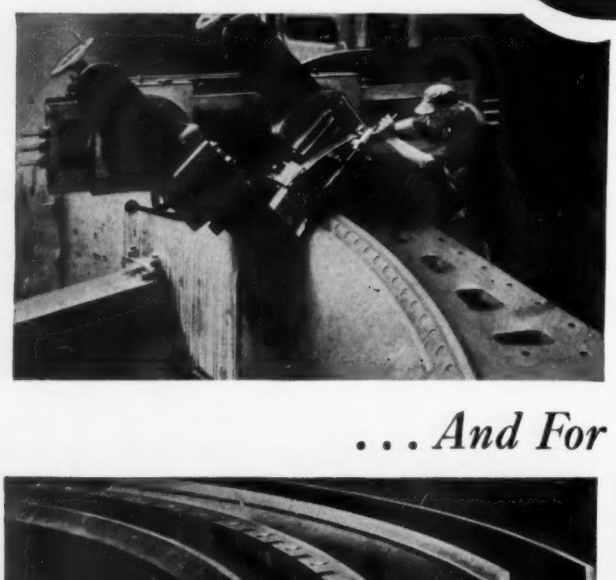
4. High resistance to corrosion to give long life and lower costs while handling brine.

5. Uniform resistance to corrosion avoids roughening of inside polished surface and banishes maintenance expense.

6. No localized corrosion at welds. Monel is a stable metal. The heat of welding does not impair corrosion resistance; so no heat treatment is necessary to restore it.

7. Available in all mill forms—warehouses at convenient points.

8. Easily fabricated and readily welded.



SEATS FOR BOULDER DAM'S GATE VALVES

Repairs on Boulder Dam would be costly; so materials were specified which would postpone repairs indefinitely. Pictured here is a Monel seated liner for the 32-ft. dia. gate valves of the water intake.

. . . And For This Job . . . These

1. High strength to eliminate distortion of seating surfaces under great pressures exerted by the water.

2. Hardness to resist wear during operation of the valve.

3. Rust proof to eliminate roughening of the seating surface and the resulting leakage.

4. Readily forged and machined to required seat shape and fastened with forged and machined Monel bolts.

YOUR tough jobs... they're not done by any metal because of just *one* property. It takes more than just hardness, toughness, or corrosion resistance to give long-lived, dependable service. That's why Monel's* unrivalled *combination* gets it assignments like the welded salt flasher shown here, or the seats for Boulder Dam. Monel is highly resistant to corrosion... that you know. But did you know that Monel is also stronger and tougher than structural carbon steel?

And for the spots where you need "extras" in any property, you get them in special types of Monel created to fill just that need. "K" Monel, for instance, can be heat treated to obtain a yield point in excess of 100,000 p.s.i. "R" Monel is free machining, for use in automatic screw machines. Special castings, too, for special needs.

Write for the condensed ready-to-use folder on Monel and its properties. And for any tough jobs you have, ask Inco's advice.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.

MONEL

*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.

As the Editor Views the News

AS YET, beating of war drums in the Orient has not affected industry severely. In spite of the ferocity of the fighting, diplomatic relations between the Chinese and Japanese governments have not been severed, nor has President Roosevelt invoked the neutrality act, which automatically would bar certain shipments from this country to the embroiled nations. To date the chief effect of the conflict upon commerce has been a sharp rise in vessel rates (pp. 18, 34) and shifting the destination of American steel from Shanghai to Hong Kong or Manila. Due to confusion in Shanghai, American importers are experiencing difficulty in obtaining quotations on tungsten ore.

• • •

Speaking of foreign trade, exports of machinery have staged an encouraging comeback since the low point of the depression. Total exports of all machinery for the first six months of 1937 were $111,247,041 (p. 20), compared with $149,270,363 in the same period of 1929. Exports of power-driven metalworking machinery (machine tools) totaling $27,769,774 in the first half of 1937 topped the $17,128,490 for the first half of 1929 by 62 per cent. World wide economic improvement is credited with much of this impressive showing, although recently the race for rearmament among the leading nations has been a dominant factor.

Machine Tool Exports High

• • •

The cost of the pastime of baiting the railroads by politicians and labor blocs is easily translated into terms of volume of materials and equipment which the carriers purchased from the iron, steel and metalworking industries. Freight car awards in the first quarter of 1937 (p. 17) compared favorably with those in the same quarter of every recent year except 1929. The roads still need more cars and many other items, but they are harassed by demands for sharp wage increases by several groups of employes which would add $150,000,000 to the railroads' wage bill. Pending federal legislation that would limit trains to 70 loaded or 125 unloaded cars is a further threat to operating efficiency and earnings. The railroad material and equipment market is attractive potentially, but it, like many other lines of activity, is held back by uncertainties of political origin.

Baiting Holds Back Railroads

• • •

One of the oldest metallurgical industries—the manufacture of chilled car wheels—is finding that systematic laboratory procedure is resulting in marked improvements in methods which already had reached a high state of perfection. Extensive research yielded a definite heat treating cycle (p. 42) which provides an increase of from 30 to 40 per cent in strength and a uniformity in strength heretofore unobtainable. A new unit type of pit, now being installed in wheel foundries, enables the makers to follow the definite heat treating cycle with a high degree of accuracy. The chilled car wheel manufacturers again prove the effectiveness of the formula: Develop an improved method by research, then reduce it to routine in all plants.

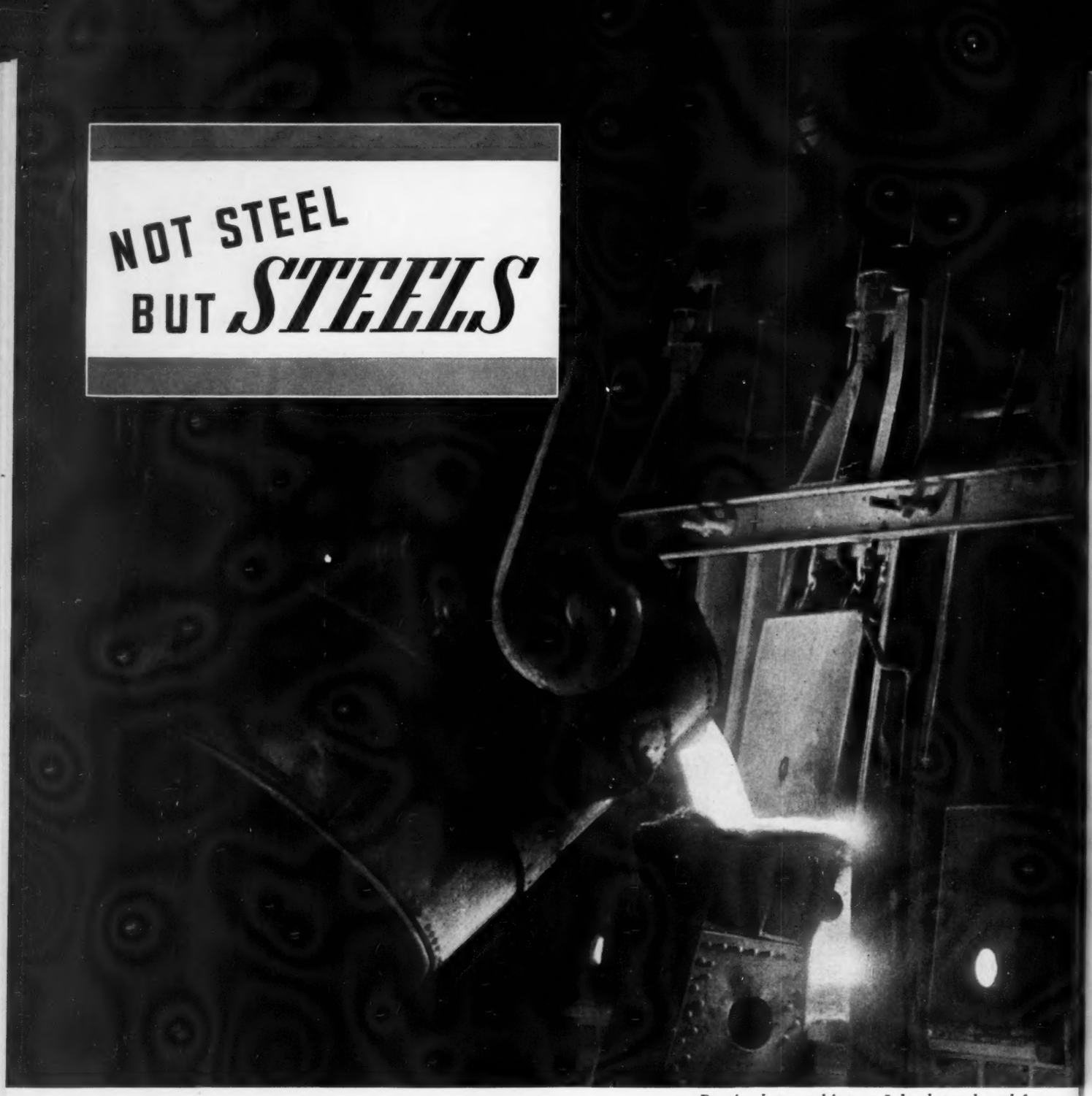
How Research Pays Its Way

• • •

A turbine expert states that steam power plants in the United States burn about the same amount of coal now as in 1920 but they generate twice as much electricity. Much of the increased efficiency is due to the use of higher steam temperatures (p. 46) and this inflicts terrific punishment upon the materials in turbines. It accentuates the importance of the "stretch" or creep of steel. Watching creep under test—week after week, month after month—affords amazing information as to the behavior of materials under heat and pressure. . . . Everybody will agree that the automobile industry has worked miracles in developing finishes for steel. Organization of co-operative effort (p. 58) is partly responsible for advances in plating, painting and enameling—and in the complementary operation of rust-proofing.

Watching the Creep of Steel

E. L. Shaner



Pouring hot metal into an Inland open hearth furnace

Today Inland's product is not *steel* but *steels*. For every heat that passes through the mill is checked to definite specifications. Elements are added; processes are altered. The customer finds that through Inland's well co-ordinated organization he is able to get better steel for his particular purpose. So much may be saved by securing a steel *exactly* suited to your particular needs —that we urge you to take advantage of Inland metallurgical cooperation.

INLAND STEEL

SHEETS • STRIP • BARS
TIN PLATE • PLATES
STRUCTURALS
PILING • RAILS
AND ACCESSORIES

INLAND STEEL COMPANY

General Offices: 38 So. Dearborn St., Chicago, Illinois • Offices in: Detroit—Kansas City—Milwaukee—St. Louis—St. Paul

Railroads Rejuvenated, but Wage Problem Impedes Steel Buying

RAILROADS will provide less business for steel producers during the second half of this year than they did during the first six months, and while recovery from the current lull is in prospect, the extent of freight car and locomotive buying will depend in large measure upon various factors affecting costs and earnings.

This represents the views of railroad, equipment and steel interests. If the outlook for railroad steel sales were regulated only by the prospective trend in general business activity and freight traffic during coming months, a more favorable picture could be drawn, since the task of rehabilitating railroad facilities is far from complete despite the substantial progress made during the year to date.

But the carriers still are reading the menu from right to left, and their financial position is not sufficiently secure to permit making all of the capital expenditures that business recovery ordinarily would dictate. True, earnings have improved so far this year, but only moderately. Net operating income for the first half was 25 per cent ahead of 1936, but on an annual basis, this represented a return of less than 3 per cent on property investment.

At the moment the question of wages looms large as an impediment to more liberal spending. The recent granting of an increase of 5 cents an hour to non-operating employes adds $98,000,000 annually to the railroads' labor costs.

Operating Men Seek Raise

Operating workers want a 20 per cent boost in pay. They will settle for less than this, but should they receive one-quarter of their demand the total annual increase in wages of all employes would be about $150,000,000.

This would wipe out practically all of the anticipated gain over last year in net operating income for 1937, and the net for the first half of this year was 48 per cent less than in the like 1929 period. Obviously, present earnings will not support a spending program of pre-depression proportions.

This is not to imply that the recent brisk activity in railroad steel production will end abruptly and be replaced by an indefinite period of poor demand. There are well-founded expectations that the summer dullness in freight car buying will be followed by renewed purchasing later this year, but it is thought likely that such orders will be principally for delivery next spring and will provide only moderate support to finished steel production during the fourth quarter.

Should the interstate commerce commission grant the railroads' petition for higher rates, and should traffic and earnings increase more rapidly than is anticipated, prospects for equipment sales would be correspondingly enhanced.

Over the long pull, however, the constant raising of freight rates is regarded with misgivings in view of the steady inroads that competing forms of transportation have made into business formerly enjoyed by

railroads, a diversion that has increased with each boost in rail charges.

The need for a continuation of freight car buying is emphasized by the fact that new car installations have failed to keep pace with retirements. Installations by Class I railroads of 34,187 new freight cars in the first half this year, although the greatest since 1930, were 21,970 less than the 56,094 cars retired. Cars on line July 1 numbered 1,697,545, against 1,742,459 a year ago. While the decrease since 1929 is 579,950 cars, this is partly offset by the increase in average car capacity and faster train speed.

More than 43 per cent of cars on line are more than 20 years old and represent prospective replacements to be made before long. About 20 per cent of the cars are more than 25 years old. On July 1 there was a surplus of 128,078 cars while 184,313, or 10.9 per cent of the total, were listed as awaiting repairs. Twelve months earlier bad-order cars totaled 254,447.

About 40,000 new cars now are on order, many of which will be delivered in time for the fall peak in freight traffic. These figures would seem to indicate that while some pinch may occur in bridging the October surge in car loadings, there is unlikely to be a serious or sustained shortage of rolling stock.

Fear Train-Limitation Legislation

Another factor expected to influence equipment buying is pending federal legislation designed to limit train lengths to 70 cars loaded and 125 cars unloaded. Should this measure become effective there would be a shortage of motive power because the railroads have an insufficient surplus of locomotives to handle the extra trains that would be required. Locomotive buying would be stimulated thereby, but the additional cost incurred by train-length limitation would impair earnings and might have an effect on purchases of freight cars.

It is common for car and locomotive orders to be bunched in the first and fourth quarters of the year, and the sharp decline in car buying the past three months partly is accounted for by the fact that builders were supplied with about all the orders they could complete in time for the equipment this fall.

Domestic Freight Car Awards

	1st Quarter	4th Quarter	Yearly Total
1925	11,935	39,715	77,110
1926	30,620	15,755	64,475
1927	25,625	16,972	63,295
1928	17,338	13,792	44,763
1929	41,163	34,977	106,105
1930	28,217	9,466	45,146
1931	2,316	1,026	10,694
1932	299	52	1,739
1933	8	1,363	2,460
1934	19,907	439	23,829
1935	833	11,450	19,308
1936	9,582	27,210	64,643
1937	30,933	.....	*47,015

*Seven months.

Car loadings invariably reach the year's high early in the fourth quarter, this being a seasonal trend. With the subsequent winter slump, demand for rolling stock eases, hence the greatest need for building up car supplies is during the current quarter. Rail buying is also done largely near the year end.

The accompanying table indicates the preponderance of car awards during the first and final quarters. This trend was distorted during the depression but was generally true during the more settled years. In 1936 there was relatively good demand during the second and third quarters also, but this was necessitated by sustained business recovery which found railroad facilities deteriorated as a result of years of inadequate replacements.

In spite of their impaired finances, the railroads have contributed heavily to improved industrial activity. Last year they spent about $770,000,000 for new equipment and materials, the largest amount spent since 1930. They bought more freight cars and locomotives than in any year since 1929. Spending this year has been even faster.

Sight should not be lost of the fact that complete business recovery is far from a reality as far as the railroads are concerned. Within the last four years they have retrieved only one-half the traffic they lost from 1929 to 1933. While it is true that some of this business was captured by competing types of carriers, there are other reasons for the lag in car loadings. By far the principal cause has been the failure of building construction to reach its pre-depression stature. Building this year is roughly about three times as active as during 1932-34 but is only about one-half the 1926-1929 volume.

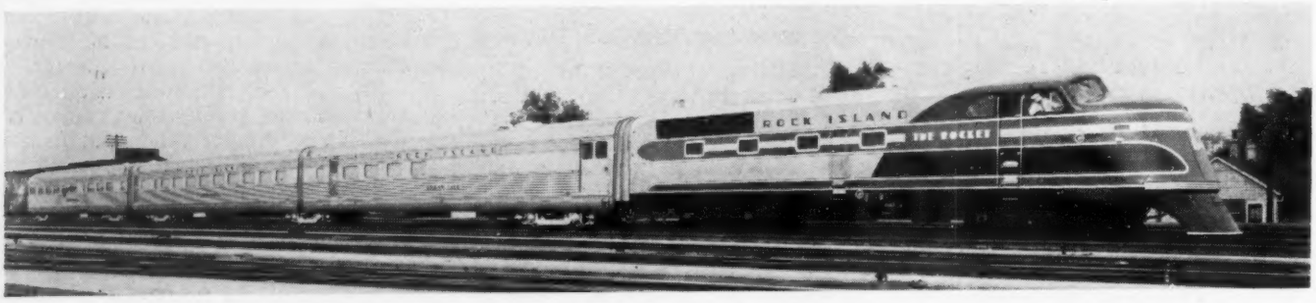
Real recovery in building will put the railroads in a much happier position. In the meantime rail executives may be expected to regulate their expenditures in close adjustment to the trend in traffic and earnings and with particular emphasis upon the latter.

Steel Products for China Rerouted

INDICATIONS at Washington that the neutrality act will not be invoked for the present in the Sino-Japanese conflict relieved considerabde tension in the export market at New York.

Earlier in the week, on the assumption that the act might be invoked, there was a flurry of inquiries from Chinese and Japanese sources for a wide variety of steel products and equipment, and important negotiations were reported under way. In Washington it was pointed out that while fighting in China has raged for six weeks a state of war has not been declared, nor has there been an official severance of diplomatic relations. (See also page 34.)

Some of the exporters most familiar with the situation in the Far East believe that Japan, given an opportunity to do so, will check its



First of a fleet of six is this new stainless steel, streamlined train for the Rock Island Lines, delivered last week. The trains, built by the Edward G. Budd Mfg. Co., Philadelphia, are pulled by 1200-horsepower diesel-powered locomotives built by Electro-Motive Corp. (General Motors subsidiary), LaGrange, Ill.

aggression in the Shanghai area, thus leaving the way open for a settlement. Japan, it is said, cannot become too ruthless with China, because China is its best customer.

American steel exporters with large staffs in China's chief commercial center devoted considerable attention to assuring themselves of the safety of their employes and families.

Vessel and cargo rates increased rapidly. Ships bound for Shanghai with steel and other commodities are changing their course to Hong Kong, where cargoes are to be stored temporarily. Some ore going to Manila.

Among the leading exports from China of interest to the American steel industry is tungsten ore. Due to the confusion in Shanghai, importers are having difficulty obtaining quotations. The trend of prices is strongly upward, but at the moment the market is difficult to establish. Certain consumers are disposed to wait pending clarification of the long-range outlook.

Even should hostilities subside, a sharp decline is not expected in tungsten ore prices, as there is a heavy demand from all parts of the world.

MUST HAVE BAMBOO STEEL FOR THE KNIVES OF CHINA

Bamboo steel to the amount of 1842 tons was shipped to China from the United States in 1936, out of a total of 3104 tons imported by that country, according to the current issue of *Iron and Steel Fortnightly,* published by the department of commerce.

Bamboo steel is peculiar to the Chinese market. It is used for manufacture of scissors, knives and other cutting devices for which the Chinese consider ordinary steel too soft. It is imported in bars about 33 inches long, in diameters from ½-inch to 1 inch.

Transverse ridges on the bars somewhat resemble the joints of bamboo, hence the name. Its history dates back to the first importation of steel into China, as recorded in the 1859 customs returns, 16 years after Shanghai had been opened to commerce, preceding the importation of mild steel.

The story is that a Chinese merchant was in need of special-size bars and placed an order with a British firm. The latter, pressed for time, not having rollers suitable for the sizes, cut small grooves in its rolls to remedy the difficulty. These produced the bamboo-like ridges.

When the Chinese merchant repeated his order smooth bars were sent but he refused to accept them. They could not be the same quality as the first, he insisted. Since that time the ridges have marked all steel for this purpose.

Bearing banners denouncing CIO, these workers are part of the 1800 who paraded through Weirton, W. Va.

One "Red Letter" Day in Weirton; New Cumberland Bids Steelworkers Welcome

EIGHT thousand employes of Weirton Steel Co. staged a protest demonstration Sunday, Aug. 15 against the CIO and national labor relations board. Banners averring satisfaction with present employment conditions and pleading for cessation of CIO and NLRB interference were carried by the throng as it paraded several miles over Weirton, W. Va., streets under a blazing sun.

Typical placards were: "This Is Our Answer to the NLRB: We Are Happy and Contented," and "Let Us Alone."

Several thousand other workers were busy in the mills and were unable to join the parade, which was sponsored by the Security league, a social and insurance benefit association of employes.

To Cove field marched the 8000. Here Senator Rush D. Holt, West Virginia's anti-administration Democrat, threatened a senatorial investigation of the labor board's "unfair" and "high-handed tactics" . . . "unless it stops those everlasting lopsided decisions." Both John L. Lewis and the NLRB are working toward the same end and the board is a "unionization scheme for Lewis' CIO," Senator Holt declared.

Citing Lewis' failure to improve conditions of the coal miners materially, the senator compared average weekly earnings: $22.20 for the miners and $38.49 for Weirton employes (based on June).

Congressman Arthur P. Lamneck, Columbus, O., advised steelworkers to "organize your own union and tell Lewis to go to hell."

Many of the workers on Monday trekked to nearby New Cumberland where the hearing on the board's complaint against the Weirton company got under way. Edward Grandison Smith, president, board of governors, West Virginia university, was trial examiner.

New Cumberland was "dressed up" for the occasion. Large red-lettered banners, hung over the highways at the town limits and over the street leading to the courthouse, declared:

"New Cumberland Welcomes Weirton Steel Employes."

Outside the courthouse boys and adults set up pop and sandwich stands. Inside church benefits were arranged. Food was a problem as the community normally has only one small restaurant. A long hearing ensued, with testimony showing how the town of Weirton was built up by the steel company, and a few former employes airing their grievances.

INLAND STEEL HEARING MAY LAST THREE MORE MONTHS

Inland Steel Co.'s hearing before the national labor relations board at Chicago has completed its eighth week, but the presentation of testimony appears likely to extend several more months. Inland attorneys recently offered 1000 witnesses, workers who at one time were members of the SWOC but who resigned. Hearing of these witnesses, at the present rate, will require about three months.

The board contends the company violated the labor act in refusing to recognize the union as bargaining agency for employes. Inland main-

tains the SWOC was not entitled to act in that capacity because it did not have a majority of the workers.

THOMPSON PRODUCTS INC. TO RESIST NLRB ORDER

Thompson Products Inc., Cleveland, last week refused to obey a national labor relations board order until required to do so by the federal courts. The board had ordered the company to reinstate with back pay three men allegedly dismissed for union activity.

Contending the men were discharged for "just and sufficient reason," the company asserted the trial examiner lacked industrial experience and "apparently substituted his personal theories of how a business should be run." Charges against the company, manufacturers of bolts and valves, were filed by the United Automobile Workers April 19.

MECHANIZATION OFFSETS INCREASE IN LABOR COSTS

Mechanization and technological improvements since the beginning of the century have offset the effect of a marked increase in labor costs and have made possible greater production and improved products without materially increasing prices to the consumer, according to the National Industrial Conference board, New York.

Although labor costs in manufacturing industry, as represented by average hourly earnings, have increased over 300 per cent above the 1899 level, prices of manufactured products have risen only 67 per cent above that year. The extent to which production improvements have contributed to keep down prices in the face of rising labor costs is indicated in part by the substantial increase in "installed primary power" and by a gradual decline in the amount of labor required in proportion to output.

Data in the census of manufactures show that between 1899 and 1929 there was an increase of 331 per cent in installed power. The index of man-hours per unit of product, as computed by the board, is now approximately 58 per cent below the 1899 level.

TENNESSEE CO. PROVIDES "CASH DAY" FOR EMPLOYES

Tennessee Coal, Iron & Railroad Co. has announced a new payroll system effective Sept. 1 whereby there will be a "cash day" between regular pay days.

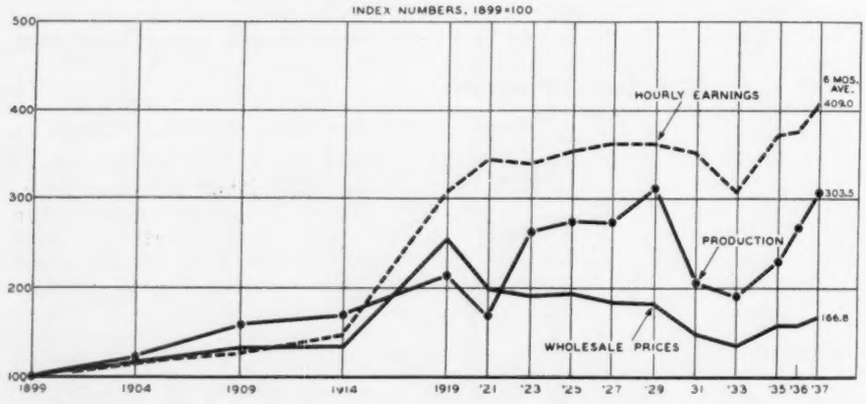
Officials said the step was taken to assist employes who are confronted with a necessity for immediate cash, or are being forced to borrow money "at exorbitant rates or to resort to other costly methods of obtaining cash."

GE MAKES COST OF LIVING ADJUSTMENT

The General Electric Co. last week announced an increase of an additional 1 per cent in its cost of living adjustment plan, raising it from 4 to 5 per cent. Instituted in October, 1936, the plan provides for automatic increases in employe earnings, based on the progress of the department of labor's cost of living index.

Under the plan, if the cost of living goes up, 1 per cent is added to employes' earnings for each point of rise in the index up to 90. It the cost of living goes down, adjustments will be made until the index reaches 80. The adjustment may take place at the half-way mark between each point. The present index figure of 84.5 thus permits the earning increase to 5 per cent.

Wages Outstrip Prices in 38-Year Rise



WHILE average hourly earnings increased more than 300 per cent since 1899 prices of manufactured products gained but 67 per cent. Production increased slightly over 200 per cent. Price curve in this chart by the National Industrial Conference board represents all commodities from 1899 to 1909 and from 1914 on, finished manufactured products. 1937 figures are for first six months

Hagan Corp. Awarded Tennessee Control Systems

Hagan Corp., Pittsburgh, has received contracts for complete combustion control system for three new slab heating furnaces and six new soaking pits in the plant of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

The furnaces will be equipped with pressure control and air-gas ratio control for all three heating zones, as well as a gas pressure control. Each furnace also will have a central control panel upon which regulators and instruments will be mounted.

Each of the six bottom-fired soaking pits will be equipped with pressure control and air-gas ratio control. Gas pressure control for the battery will be included. Control and instruments for each hole will be mounted on a separate panel.

Pressure control equipment for soaking pits now is being installed by the company in plants of the Granite City Steel Co., Granite City, Ill., and the Steel Co. of Canada, Hamilton, Ont.

Hagan Corp. also has received a contract for a complete automatic boiler control system for the $5,000,000 power plant extension now being constructed at the James H. Reed station on Brunot Island, by the Duquesne Light Co., to take care of the increasing load in Pittsburgh and surrounding communities.

Clark Controller Has Record New Bookings

Clark Controller Co., Cleveland, P. C. Clark, president, manufacturer of electric controls, is experiencing a distinctly contra-seasonal increase in new business. Bookings in August promise to exceed by 30 to 40 per cent the previous alltime record of May. Mr. Clark believes the year will make a new record for his company.

Increased demand is coming from steel mill construction and from the automotive industry. Installation of presses by the latter is requiring much in the way of control equipment. Some of the equipment now on order will not be delivered until early in 1938.

Rust Will Build Water System for Irvin Works

Rust Engineering Co., Pittsburgh, has been awarded a contract by Carnegie-Illinois Steel Corp. for a complete water works system for the

How United States Machinery Exports Have Recovered

Machinery Groups	1929	1933	1934	1935	1936	1937
			—January-June—			
Power-generating, except electric and automotive	$13,432,362	$1,523,199	$2,772,409	$4,181,503	$4,497,365	$6,912,139
Construction, conveying	13,611,114	1,264,435	2,604,573	3,475,527	5,012,756	10,131,365
Mining, well, pumping	27,368,653	5,300,953	9,807,540	14,205,269	16,413,114	28,606,379
Power-driven metalworking	17,128,490	3,442,851	10,545,520	11,113,900	21,917,369	27,769,774
Other metalworking	3,903,889	590,321	1,364,115	1,149,288	2,691,718	2,168,789
Textile, sewing, shoe	14,201,147	4,097,216	7,712,819	7,487,284	10,388,487	10,283,400
Other industrial machinery	48,801,227	6,388,579	11,448,669	15,308,060	17,455,638	25,304,185
Printing, bookbinding	10,823,481	2,017,570	3,872,753	4,341,739	5,902,379	6,070,378
TOTAL	$149,270,363	$24,625,121	$50,128,398	$61,262,560	$84,279,326	$111,247,041

new Irvin works between Dravosburg and Clairton, Pa. Contract calls for expenditure of approximately $800,000 and will be one of the largest plants ever built purely for industrial use.

Initial capacity will be 36,000,000 gallons per day, with provision for ultimate capacity of 72,000,000 gallons, sufficient for a city of 750,000 population.

Water will be taken from the Monongahela river through a reinforced concrete open intake 27 feet wide and nine feet deep, and elevated 450 feet through a 42-inch line to a steel reservoir of 3,750,000 gallons capacity located on a hill above the plant.

Pump room has been arranged for immediate installation of three pumps with a capacity of 8500 gallons per minute.

Exports of Metalworking Machinery in First Half Top 1929 by 62 Per Cent

STEADY recovery in machinery exports since the low point in 1933, led by metalworking machinery, has placed shipments during the first six months of 1937 within 26 per cent of the comparable figure for the peak export year, 1929. The recovery has not been uniform for the eight machinery groups, as indicated in the accompanying table.

As a result of world-wide economic improvement and heavy demands in many countries, due to rearmament plans, export sales have made most improvement in machine tools. Foreign sales of metalworking machinery gained sharply after 1933, exceeding corresponding shipments in 1929 by 28 per cent in the first six months of 1936 and increased to 62 per cent over the 1929 figure in the first half of this year.

The largest foreign market for this equipment has been the United Kingdom, in which demand arising from rearmament has exceeded capacity of domestic machinery manufacturers, requiring large imports, chiefly from the United States and Germany. This has aided American manufacturers in selling abroad, not only in British but also in markets where British manufacturers have been less active while attempting to satisfy domestic demand.

Machine Tools Lead Upturn

Practically all types of metalworking machinery have shared in this upturn, but particularly machine tools.

Exports in the mining, well and pumping equipment group increased from 60 per cent of the comparable 1929 figure to 105 per cent for first half of this year. Shipments of construction and conveying, power-generating and other industrial machinery groups have gained consistently since 1933 and especially during this year, but remain below the 1929 figure. While the group as a whole is below the 1929 mark some classes have reached a higher level, including dredging and road-building equipment and oil well machinery.

Export of textile, sewing and shoe machinery and other groups has been irregularly upward since 1933, largest in industrial sewing machines and looms.

Slicing an Ingot

SLICING an ingot is a difficult job, even when only two lathe tools are used. The picture shows seven slices being made simultaneously in a carbon tool steel ingot, with two tools in each slice. An average slice is about ¾-inch wide and 8 inches deep, and one hour and 45 minutes is required for cutting a 23-inch diameter octagon ingot into eight pieces. Photo is by John P. Mudd, personnel supervisor, for the Midvale Co., Nicetown, Pa., in its No. 5 testing machine shop

First Half Pig Iron 46% Over 1936

PIG iron production for the first half of 1937 totaled 19,482,002 gross tons, according to the American Iron & Steel institute.

This figure represents an increase of 46 per cent over the 13,367,785 tons for the first half of 1936, and a gain of 16 per cent over the 16,848,762 tons for the last half.

Pennsylvania was the largest producer in the first half of this year, with 6,453,907 tons, and Ohio was second at 4,175,367 tons. Of the pig iron produced, 13,540,251 tons were basic, 3,445,992 tons bessemer and low phosphorus, 1,389,404 tons foundry, 1,055,298 tons malleable, 13,628 forge or mill, and 37,429 white and mottled, direct castings, etc.

Ferroalloy production, including that from electric furnaces, was 493,498 tons for the half year, with Pennsylvania the largest producer at 216,969 tons. Ferromanganese and spiegeleisen totaled 237,335 tons, ferrosilicon 215,437 tons, and other ferroalloys, 40,726 tons.

Production

A REDUCTION of 3 points in the national steelworks operating rate last week brought it to 81 per cent of capacity. Much of the decline resulted from open hearths being taken off for repairs.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Aug. 21	Change	1936	Same week 1935
Pittsburgh ..	79.5	—3.5	72	43
Chicago	86.5	+0.5	72½	60
Eastern Pa...	65	—4	50½	33
Youngstown .	73	—5	74	60
Wheeling ...	89.2	—4.8	95	76
Cleveland ...	79.5	—5.5	79½	51
Buffalo	86	none	81	37
Birmingham .	96	none	64	35½
New England	75	+10	78	73
Detroit	95	—5	100	94
Cincinnati ..	93	+4	76	†
St. Louis	84	+7	†	†
Average ..	81	—3	72	52½

†Not reported.

Chicago—Increased 0.5 point to 86.5 per cent, a new peak for the year, with the largest tonnage output for this period in history. Blast furnace operation is steady with 31 of 39 stacks active.

New England—Up 10 points to 75 per cent. For the week beginning Aug. 23 the rate will be about 60 per cent, one steelworks taking off several units.

St. Louis—Increased 7 points from 77 to 84 per cent. Two additional open hearths are scheduled to be lighted early in September.

Birmingham, Ala.—Unchanged at 96 per cent, with 18 of 19 open hearths active.

Wheeling—Down 4.8 per cent from 94 to 89.2 per cent.

Pittsburgh—Down 3.5 points, from 83 to 79.5 per cent. Carnegie-Illinois Steel Corp. is at 75 per cent against 84 per cent the preceding week. Jones & Laughlin Steel Corp. increased from 78 to 80 per cent. National Tube Co. has lighted three open hearths at McKeesport works.

Buffalo—No change has been made in steelworks operations, which are at 86 per cent.

Central eastern seaboard—Down 4 points to 65 per cent on reduction by leading independents. No further cut is expected for next week, although backlogs of some mills are down to two or three weeks.

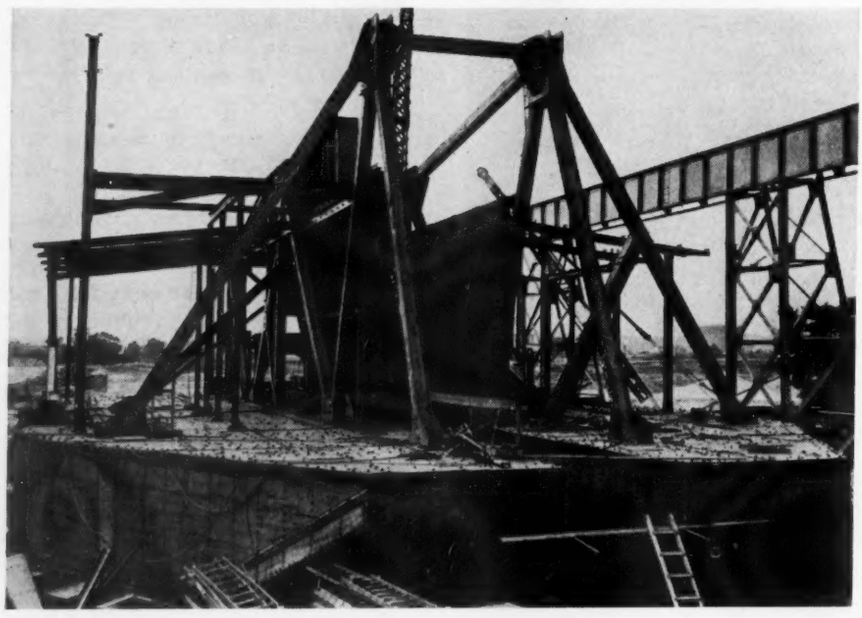
Youngstown—Down 5 points to 73 per cent, with 62 open hearths, three bessemers and 21 blast furnaces active. Decline is attributed to lack of automotive tonnage. The same schedule is indicated for this week.

Detroit—Down 5 points to 95 per cent, with 20 of 21 open hearths operating.

Cleveland—Off 5.5 points to 79.5. Republic Steel Corp. and Otis Steel Co. each have one open hearth off for repairs.

Cincinnati—Increased 4 points to 93, one producer operating all its open hearths.

Steel To Dredge for Gold, Platinum in South America



THIS 1000-ton steel dredge will dig for gold and platinum in river bottoms in South America. Under construction at the Birmingham, Ala., plant of the Ingalls Iron Works, it will be dismantled and shipped in sections to New Orleans, thence by boat to Colombia and overland to an unnamed destination

Canadian Steel, Iron Output Gains in July

Production of steel ingots and castings in Canada in July was 122,968 tons, compared with 118,744 tons in June and 68,793 tons in July, 1936. For seven months output was 836,145 tons, against 647,493 tons in the corresponding period of 1936.

July pig iron production in July was 79,736 tons, compared with 78,278 tons in June and 34,988 tons in July, 1936. Of this total 52,445 tons, 66 per cent, was for use of makers and 27,291 tons for sale. For seven months pig iron production totaled 503,680 tons, compared with 375,323 tons in the comparable period of 1936.

Foundry Equipment Orders Show Decline in July

Orders for foundry equipment in July declined slightly from June but were much higher than in July, 1936, according to the Foundry Equipment Manufacturers association, Cleveland. The net order index for July was 204, compared with 228.2 in June and 159.6 in July, 1936. The shipment index was 216.5 for July, 232.1 for June and 145.7 for July, 1936. Unfilled order index was 360.3 for July, 372.8 for June and 144.5 for July, 1936. Indexes are based on average of 1922-24 as 100 per cent.

Men of Industry

A R. FISHER, J. P. Kottcamp and Alexander Cromwell have been elected vice presidents, Johns-Manville Products Corp. They will have general supervision over newly-established manufacturing districts, each of which includes five factories.

Mr. Fisher, formerly manager of the company's factory at Manville, N. J., has been assigned the eastern district; Mr. Kottcamp, who has been manager of the mid-western factory at Waukegan, Ill., has been assigned the central division, with headquarters at Waukegan; Mr. Cromwell has been placed in charge of manufacturing activities on the Pacific coast.

J. E. Begert, formerly head of the cost reduction department in New York, succeeds Mr. Fisher as manager of the Manville plant; K. W. Huffine, formerly manager of the Alexandria, Ind., plant, succeeds Mr. Kottcamp at Waukegan as manager; H. J. O'Brien, heretofore superintendent of the rock wool department at Manville factory, has become manager of the Alexandria plant.

♦ ♦ ♦

Richard M. Bow has been named superintendent of industrial relations at the Allenport and Monessen plants of Pittsburgh Steel Co., Pittsburgh.

♦ ♦ ♦

Oscar P. Patzke, who became identified with the Smith Steel Foundry Co., Milwaukee, June 1, has been elected a vice president, but will continue to direct sales.

♦ ♦ ♦

Eugene D. Wilson, 703 Columbian Mutual tower, Memphis, Tenn., has been named district representative in that territory for Foote Bros. Gear & Machine Corp., Chicago.

♦ ♦ ♦

Kermit Donaldson, assistant sales manager, Machined Steel Castings Co., Alliance, O., has become plant superintendent of the company. He succeeds L. C. Hetzel, who has resigned due to ill health.

♦ ♦ ♦

M. I. Dorfan, former manager of the dust control division of Blaw Knox Co., which recently was taken over by Pangborn Corp., Hagerstown, Md., has been re-employed by Pangborn to act as general field representative under the title of dust control specialist.

♦ ♦ ♦

J. Stevens Ronay, associated with Republic Steel Corp., Cleveland, as structural steel designer, has sailed for Jamshedpur, India, where he will become identified with the Tata Iron & Steel Co. Ltd.

♦ ♦ ♦

Walter D. Wood Jr., member of the discus squad of the 1936 United States Olympic team, has been appointed to the sales staff, Philadelphia office of Lincoln Electric Co., Cleveland, manufacturer of arc welding equipment.

♦ ♦ ♦

James O. McDowell, superintendent of the sheet mill department of

James O. McDowell

International Nickel Co. at Huntington, W. Va., since 1929, has become associated with R. M. Gordon & Co., maker of lubricating systems. Mr. McDowell, who has had practically 30 years experience in sheet mill rolling and management, will devote most of his time to the introduction of lubrication to sheet mills.

♦ ♦ ♦

Carl V. Reilly, 3537 Antisdale avenue, Cleveland Heights, O., has been appointed sales representative covering northern Ohio and the city of Buffalo for Thermal Products Corp., Pittsburgh. His headquarters are in Cleveland.

♦ ♦ ♦

W. C. Grove has been appointed manager at Chicago for Buffalo Foundry & Machine Co., Buffalo. He has been with the company nine years, and for the past six years has been manager of the Toronto office.

♦ ♦ ♦

Carroll F. Brown has been appointed assistant director of personnel in the Pittsburgh district for Carnegie-Illinois Steel Corp., and L. P. Ray has been appointed superintendent of industrial relations of Farrell works.

♦ ♦ ♦

S. J. Moran formerly purchasing agent for Union Steel Casting Co., is now assistant treasurer. He has been associated with the company 18 years. R. D. Kennedy has been appointed purchasing agent.

♦ ♦ ♦

Adolph Pohl, formerly associated with Buell Die & Machine Co., Detroit, has been made superintendent, Partool Machine Co., Detroit, maker of special machinery, jigs, tools and fixtures.

♦ ♦ ♦

R. G. Dickens, for 20 years chief clutch engineer at the Elmira, N. Y., plant of Hilliard Corp., has been transferred to Chicago in charge of sales and services of all types of Hilliard clutches, with offices at 201 North Wells street.

♦ ♦ ♦

Henry Rowe, superintendent on the Gogebic range for the Oliver Iron Mining Co., with offices at Ironwood, Mich., has retired and has been succeeded by Harry W. Byrne, assistant superintendent for ten years.

♦ ♦ ♦

B. M. Conklin, chief engineer, Great Northern Iron Ore Properties, Hibbing, Minn., will retire Oct. 1 and move to his citrus fruit ranch near Phoenix, Ariz. C. J. Calvin, assistant chief engineer for the past 18 years, will succeed Mr. Conklin.

♦ ♦ ♦

R. F. McConnell, recently assistant general manager of sales in field divisions of Standard Oil Co. of Indiana, has been made assistant general manager of the general sales division, succeeding the late H. A. Lewis.

♦ ♦ ♦

Marvin Marsh, special sales representative in the Kansas City, Mo., territory for American Rolling Mill Co., has been named manager of the company's newly created district office at 7100 Roberts street, Kansas City.

♦ ♦ ♦

Ross L. Leffler, manager of industrial relations for the Pittsburgh district, Carnegie-Illinois Steel Corp., has been re-appointed a member of the Pennsylvania Game commission to serve until 1943. He is at present vice president of the commission.

♦ ♦ ♦

Sam Davey, superintendent of the tin plate division at Canton, O., of Republic Steel Corp., Cleveland, has resigned to become vice president in charge of operations, Canton Metal Decorating Co., Canton. Mr. Davey was one of the founders of the Canton Tin Plate Co. in 1930,

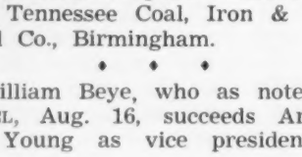
and served as superintendent since the company became a part of Republic.

♦ ♦ ♦

Stephen McGinnis, for a number of years engaged in newspaper work, principally with the Birmingham bureau of the United Press, has become assistant to E. D. LeMay, director of public relations for the Tennessee Coal, Iron & Railroad Co., Birmingham.

♦ ♦ ♦

William Beye, who as noted in STEEL, Aug. 16, succeeds Arthur H. Young as vice president in



William Beye

charge of industrial relations, United States Steel Corp., New York, will assume his new duties in New York about Sept. 10. Mr. Beye was born in Chicago, July 21, 1881. He was graduated from the University of Wisconsin in 1902 and from Lake Forest college in 1904, being admitted to the bar in Illinois in that year. He is credited with the authorship of the Illinois workmen's compensation act. As previously noted, he is a member of the firm of Knapp, Beye, Allen & Cushing, Chicago, which has been division counsel for United States Steel subsidiaries 35 years.

♦ ♦ ♦

J. Murray Lenhart, chief inspector at Duquesne works since 1908, has been assigned to special metallurgical duties in the Pittsburgh district offices of Carnegie-Illinois Steel Corp. He will be succeeded at Duquesne by John R. Anderson, whose former position was metallurgical contact man for the Cleveland-Buffalo district.

♦ ♦ ♦

Charles L. Dunbar, president, Cohoes Rolling Mill Co., Cohoes, N. Y., announces the following appointments, subject to confirmation at the first meeting of the board of directors: A. M. Mosley, vice president and general manager; M. L. Jacob, assistant general manager; A. Macfadyen, vice president in charge of purchases; W. S. Crawford, vice president in charge of credits and accounts; R. C. Poskanzer, treasurer; C. D. Mauchan, assistant treasurer; W. S. Crawford, secretary; John W. Cooper, sales manager.

♦ ♦ ♦

Blaine S. Smith, president, Universal Atlas Cement Co., Chicago, announces the following election and appointments: George H. Reiter, vice president, and W. L. Greenly, assistant to vice president; A. C. Cronkrite, vice president, and Paul F. Keatinge, assistant to vice president; O. H. D. Rohwer, vice president, and James D. Scovel, assistant to vice president, all of Chicago; George S. Neel, sales manager, Des Moines, Iowa; L. B. Thomas, district sales manager, St. Louis; A. O. Stark, vice president, New York; W. R. Heckendorn, sales manager, New York; W. A. McIntyre, sales manager, Philadelphia; Floyd L. Mabie, manager, Atlas White bureau, New York. F. L. Stone and Paul C. Van Zandt also are vice presidents.

Died:

JOHN BIGGERT, the past 19 years service engineer, United Engineering & Foundry Co., Pittsburgh, in Pittsburgh, Aug. 10. A graduate of University of Pittsburgh, he was instrumental in the development of many standard rolling mill practices, and was an authority on the cold rolling of strips and sheets. Previous to joining United Engineering he was associated with the former Carnegie Steel Co. and Jones & Laughlin Steel Corp.

♦ ♦ ♦

John A. Crook, 58, president, Denver Steel & Iron Works, Denver, in that city, Aug. 9.

♦ ♦ ♦

G. E. Weissenburger, president, Keokuk Electro-Metals Co., Keokuk, Iowa, in Keokuk, July 5.

♦ ♦ ♦

George Robert Kerr, 55, vice president and treasurer, Canadian Westinghouse Co. Ltd., Hamilton, Ont., in that city, Aug. 13.

♦ ♦ ♦

C. C. McConville, 63, superintendent, Clintonville, Wis., factory of Four Wheel Drive Auto Co., in Clintonville, Aug. 12. He was a member, Society of Automotive Engineers.

♦ ♦ ♦

Albert W. Wenzel, developer of piston rings for internal combustion motors, at his home in West Orange, N. J., Aug. 12. He organized the American Hammered Piston Ring Co. in 1903; sold it in 1907, and later he became president, United States Hammered Piston Ring Co., Sterling, N. J.

♦ ♦ ♦

George W. Whitehouse, 76, who for many years was manager of the Milwaukee branch, Graton & Knight Co., Worcester, Mass., maker of leather belting and other mill supplies, Aug. 8.

♦ ♦ ♦

James S. Mattimore, 62, vice president, Walworth Co., New York, pipe fittings and valve manufacturer, in Brooklyn, N. Y., Aug. 12. He also was treasurer, Manufacturers Standardization society, and a director, Valve and Fittings institute.

♦ ♦ ♦

Erwin J. Schmidt, 47, sales manager, Worden-Allen Co., Milwaukee, bridge and structural firm, of heart attack on Aug. 13 while playing golf. Born in Milwaukee, he attended the engineering college of the University of Wisconsin, and joined the company in 1913.

♦ ♦ ♦

Oliver W. Loomis, 65, former vice president, National Malleable & Steel Castings Co., Cleveland, and a director for the past 13 years, in Ludington, Mich., Aug. 19, while on vacation. Mr. Loomis joined National Malleable in 1891, serving in various capacities until 1919 when he was appointed sales manager. He was first vice president from 1933 until his retirement in 1936.

♦ ♦ ♦

George Robert Bott, 58, chief engineer and a director, Norma-Hoffman Bearings Corp., Stamford, Conn., in New Canaan, Conn., Aug. 14. Born in Columbus, O., he was graduated from Ohio State university in 1901. He joined the Norma-Hoffman organization about 25 years ago. Mr. Bott held numerous patents on antifriction bearings and other mechanical devices. He was a member, Society of Automotive Engineers and American Society of Mechanical Engineers.

♦ ♦ ♦

Jordan Korp, 64, associated with Leeds & Northrup Co., Philadelphia, and widely known in the field of heat treating, at his home in Philadelphia, Aug. 10. A native of Norway, Mr. Korp was selected by the Norwegian government in 1904 to come to the United States for a postgraduate course in his trade as toolmaker. A year later he returned to Norway, made his report, discharged his obligations, and then returned to this country. He took a position as toolmaker with Leeds & Northrup, becoming foreman of the toolroom. He contributed considerably to development of improved methods for tool hardening.

Activities of Steel Users and Makers

MATHEWS CONVEYER CO., Ellwood City, Pa., has opened a Detroit sales-engineering office at 2844 West Grand boulevard. Two Mathews engineers, familiar with the Michigan territory, will be in charge, and in addition sub-agents are being located throughout the state. For the past 20 years the company was represented in Michigan by Palmer-Bee Co.

♦ ♦ ♦

Allegheny Steel Co. has put into production at its Brackenridge, Pa., plant a new 25-ton electric furnace, adding 36,000 tons annually to its production capacity on high alloy stainless and corrosion-resisting steels.

♦ ♦ ♦

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., reports shipments for the first seven months of 1937 totaled $2,910,000, an increase of 67.1 per cent, compared with the total of $1,740,000 for the corresponding period in 1936. July shipments at $440,000 were topped only by March and April this year.

♦ ♦ ♦

Interlake Iron Corp. has signed a 10-year contract with the Peoples Gas, Light & Coke Co., Chicago, for sale of gas from the former's South Chicago, Ill., coke plant. The contract represents an unstated increase over amount formerly disposed of under short term contracts. The new agreement is subject to modification after Dec. 1, 1939.

♦ ♦ ♦

Reorganization of Mercer Tube & Mfg. Co., Sharon, Pa., has been completed with the re-election of Henry Greenberg, New York, as president. D. V. Sawhill is treasurer and general manager; Samuel Goldberg, Philadelphia, is secretary, and O. L. Long, comptroller. The company recently was released from receivership in Pittsburgh federal court.

♦ ♦ ♦

Dravo Corp., Pittsburgh, will complete a new 10-ton capacity ore bridge at the Great Lakes Steel Corp. Hanna furnace dock at Zug Island, Detroit, by Sept. 1. Ordered April 1, the bridge originally was to be completed by Oct. 1. Continued high rate of steel production caused Great Lakes to request a reduction in delivery time to five months; ordinarily seven to eight months are required.

♦ ♦ ♦

Detroit Macoid Corp., Detroit, producer of molded plastic products and cellulose coated metal parts, principally automobile hardware, has leased the branch plant of Yale & Towne Mfg. Co. at 12340 Cloverdale avenue. The latter plant formerly manufactured automobile locks and was closed following a labor dispute in May. Jacob E. Goldberg, treasurer of the Macoid organization, states the new quarters will provide 20 per cent more space than present facilities at 8745 Conant street.

♦ ♦ ♦

Heil Co., Milwaukee, maker of trucks, tanks, oil burners, and hydraulic hoists, has sold the plant of the former Milwaukee Air Power Pump Co., and Combustion Oil Burner Co., now Heil units operating in the main works, to the Globe-Union Mfg. Co., Milwaukee, maker of storage batteries, spark plugs, roller skates, etc. The property, containing 20,000 square feet, adjoins the Globe-Union works and a large part of it has been occupied by that firm for a year or more.

Financial

CRUCIBLE STEEL EARNINGS SHOW MARKED GAIN

CRUCIBLE STEEL CO. OF AMERICA, New York, in its report for the first half shows net profit of $3,099,797, equivalent to $5.03 per share on 450,000 shares of common stock outstanding, after allowances for all taxes except on undistributed earnings. This compares with $1,262,513 for the first six months in 1936, equivalent to 95 cents per share.

SHEET & TUBE INCREASES QUARTERLY DIVIDEND

Directors of Youngstown Sheet & Tube Co. declared the regular quarterly dividend of $1.37½ per share on the preferred stock and increased the regular quarterly dividend on the common stock from 75 cents to $1 per share. Both dividends are payable Oct. 1 to shareholders of record Sept. 11.

PITTSBURGH FORGINGS BUYS STEEL CAR PREFERRED

Pittsburgh Forgings Co., Pittsburgh, has bought all the outstanding preferred stock of the Greenville Steel Car Co., Greenville, Pa., comprising 6296 shares of $100 par value. It owns also all common stock of the company.

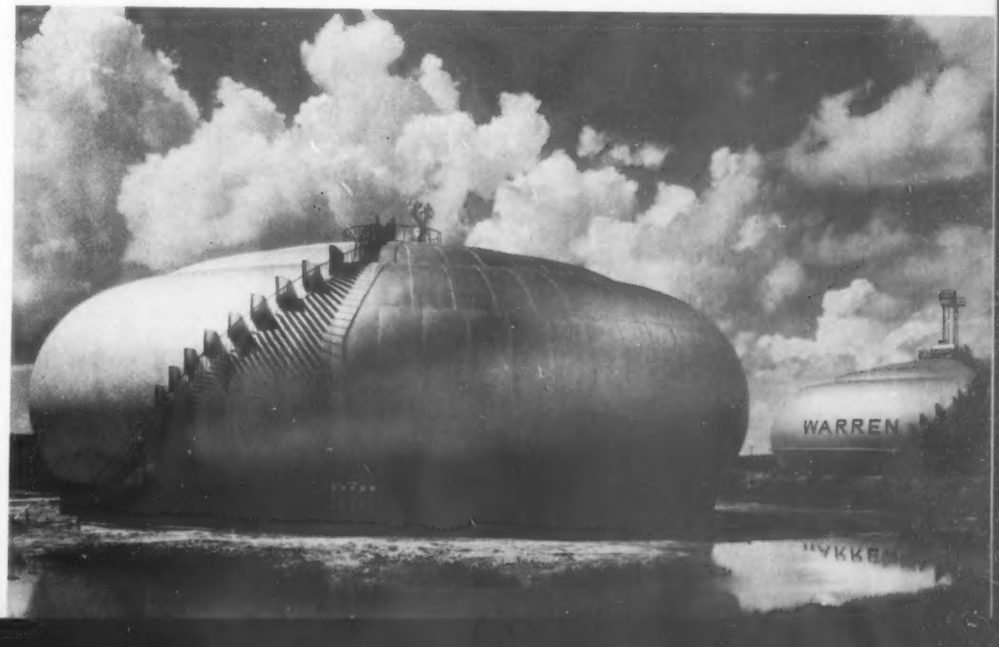
BLAW-KNOX FIRST HALF PROFIT $1,295,513

Blaw-Knox Co. reports net profits for the first half of $1,295,513 after provision for all taxes except federal surtax on undistributed profits. This is equivalent to 97 cents a share on 1,332,558 shares of capital stock outstanding.

These earnings compare with $675,293, or 51 cents a share for the corresponding period of 1936 on 1,322,395 shares then outstanding.

♦

Steel Spheroids in Texas



DESIGNED to store natural gasoline under pressure to prevent loss through evaporation, these two Hortonspheroids are of all-welded steel construction. The tanks are 141 feet, 6 inches in diameter and 40 feet high, each of 100,000-barrel capacity. The one at the right is to withstand internal pressure of 10 pounds per square inch; the one in foreground, 15 pounds per square inch. They were fabricated recently for the Warren Petroleum Co., Port Arthur, Tex., by Chicago Bridge & Iron Co., Chicago

Meetings

A.I.M.E. DIVISIONS PLAN METAL CONGRESS MEETINGS

TWO divisions of American Institute of Mining and Metallurgical Engineers will hold their fall meetings in Atlantic City, N. J., Oct. 19-21, in connection with the nineteenth annual National Metal congress and exposition. These are the Iron and Steel division and Institute of Metals division. Headquarters will be at the Ritz-Carlton hotel.

The program will feature a sequence of sessions on the physics of metals. A roundtable will cover discussions of stress-strain relationships of unilateral, bilateral and three-dimensional stresses, true stress-strain curves, and transmission of energy through crystalline media. A session on physics of metals will comprise papers on the theory of diffusion, a study of the flow of metals with particular reference to elongation at the yield point, and a paper on the meaning of impact tests.

The science lecture, concluding this sequence on physics of metals, will be delivered by Prof. Arthur F. Benton, University of Virginia, Charlottesville, Va. It will deal with "Behavior of Gases at Metal Surfaces."

Other sessions will be devoted to general metallurgy, metallography and open-hearth steel practice.

PORCELAIN ENAMEL GROUP PLANS TWO OCTOBER EVENTS

Porcelain Enamel institute is planning two open meetings for the week of Oct. 11. The first is the organization's seventh annual meeting at the Congress hotel, Chicago, Oct. 11-12; and the second is a porcelain enamel forum at Ohio State university, Columbus, O., Oct. 13-15.

Feature of the annual meeting will be a report of the institute's technical director, Prof. R. M. King, Ohio State university, on the use of porcelain enamel in the architectural field.

The Columbus forum was organized because the first one at the University of Illinois last May proved so successful. The program will embrace and discuss all phases of the porcelain enameling industry with separate sessions on cast iron, sheet iron and hollow ware.

George P. MacKnight, 612 North Michigan avenue, Chicago, is managing director of the institute.

IRON AND STEEL ENGINEERS EXPECT TO BREAK RECORD

The thirty-third annual convention and exposition of the Association of Iron and Steel Engineers to be held at the Stevens hotel, Chicago, Sept. 28-Oct. 1, probably will be the largest in the association's history. Over 5000 steel mill engineers and executives are expected to attend.

Some 25 papers dealing with operating problems are scheduled for presentation at the convention's technical sessions. More than 150 manufacturers of steel mill equipment will be represented in the Iron and Steel exposition and many of the exhibits will be in operation.

Two plant visitations will be made during the week, one to the Gary sheet and tin plate division of Carnegie-Illinois Steel Corp. and the other to the Indiana Harbor works of Inland Steel Co.

WELDING SOCIETY ARRANGES METAL CONGRESS PROGRAM

An imposing array of papers is scheduled for presentation at the eighteenth annual meeting of the American Welding society, Hotel Traymore, Atlantic City, N. J., Oct. 18-22, in connection with the nineteenth annual National Metal congress and exposition. The tentative program lists a business session, medal awards, election of officers, a dinner and 27 technical papers.

Sessions are arranged under the following headings: Industrial research; fundamental research in welding; fabrication; alloy steels; shipbuilding; and railroads.

CALL OFF MINING MEETING

Lake Superior Mining institute will not meet this year, A. D. Chisholm, Duluth, president, announced. Mining companies are exceedingly busy with heavy requirements for ore, and attendance therefore would be small, it was explained.

Built for Research

GROUND floor of this building in Columbus, O., recently added to the facilities of Battelle Memorial institute, is occupied by a complete experimental foundry, two stories high. Ore concentration and coal preparation laboratories are located on the third floor; offices and private laboratories on the fourth. *See also* STEEL, *Aug. 16, page 44*

Convention Calendar

Sept. 6-10—American Mining congress. Annual metal mining convention and exposition at Salt Lake City, Utah. Julian D. Conover, 439 Munsey building, Washington, is secretary.

Sept. 6-10—American Chemical society. Fall meeting at Rochester, N. Y. Dr. Charles L. Parsons, 728 Mills building, Washington, is secretary.

Sept. 6-10—British Institute of Metals. Autumn meeting in Sheffield, England. G. Shaw Scott, 36 Victoria street, Westminster, London S.W. 1, is secretary.

Sept. 14-17—British Iron and Steel institute. Autumn meeting in Middlesbrough, England. K. Headlam-Morley, 28 Victoria street, London S.W. 1, is secretary.

Sept. 19-23—American Transit association. Fifty-sixth annual convention at Greenbrier hotel, White Sulphur Springs, W. Va., Headquarters are at 292 Madison avenue, New York.

Sept. 20-22—American Gear Manufacturers association. Twentieth semi-annual meeting at Spink-Wawasee hotel, Lake Wawasee, Ind. J. C. McQuiston, Penn Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

Sept. 22-24—National Industrial Advertisers association. Annual conference at Edgewater Beach hotel, Chicago. M. R. Webster, 100 East Ohio street, Chicago, is secretary.

Sept. 27-Oct. 1—American Gas association. Nineteenth annual convention in Cleveland. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Sept. 28-Oct. 1—Association of Iron and Steel Engineers. Thirty-third convention and exposition at Hotel Stevens, Chicago. Brent Wiley, 1010 Empire building, Pittsburgh, is managing director.

Sept. 30-Oct. 1—American Foundrymen's association. Foundry conference at Battelle Memorial institute, Columbus, O. Dr. C. H. Lorig, 505 King avenue, Columbus, O., is in charge of arrangements.

Heavy Steel Products Gain

OUTPUT of steel products for sale in the first half of this year was at the rate of 84.4 per cent of finishing capacity, according to the American Iron and Steel institute. As the output for the second quarter is given in the report as 84.5 per cent a remarkably steady rate is indicated between the two quarterly periods, despite the strike in May and June.

A shift of tonnage toward the heavier forms was apparent. Output of structural shapes increased from 55.7 per cent of capacity in first quarter to 68.4 per cent in second quarter; steel piling from 34.8 to 49.8; heavy rails from 42.6 to 50.2; light rails from 14.4 to 27.4; axles from 36.3 to 40.9; spikes from 36.0 to 39.3; steel bars from 57.5 to 61.7.

On the other hand, lighter steel products declined slightly. Output of drawn wire dropped from 80.2 per cent in first quarter to 71.2 in second quarter; sheets from 89.9 to 85; hot-rolled strip from 77.6 to 67.9 and cold-rolled from 80.3 to 70.2. Tin plate did not follow the lead of other flat-rolled products, rising from 81.2 in first quarter to 92.2 per cent.

Exports of steel products gained sharply, totaling 401,993 tons in first quarter and 613,807 tons in second quarter, for a total of 1,015,800 in the half year. This compares with total steel exports of 1,135,167 tons for 12 months of 1936. Exports of pig iron and ferroalloys in the first quarter were 39,454 tons, second quarter, 112,704, total first half, 152,158 gross tons, compared with 6983 tons for all of 1936.

Steel tonnage supplied for conversion into further finished products amounted to 2,348,665 gross tons for first half, divided 1,213,282 tons for first quarter and 1,135,383 tons for second quarter.

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

Second Quarter 1937 (period)

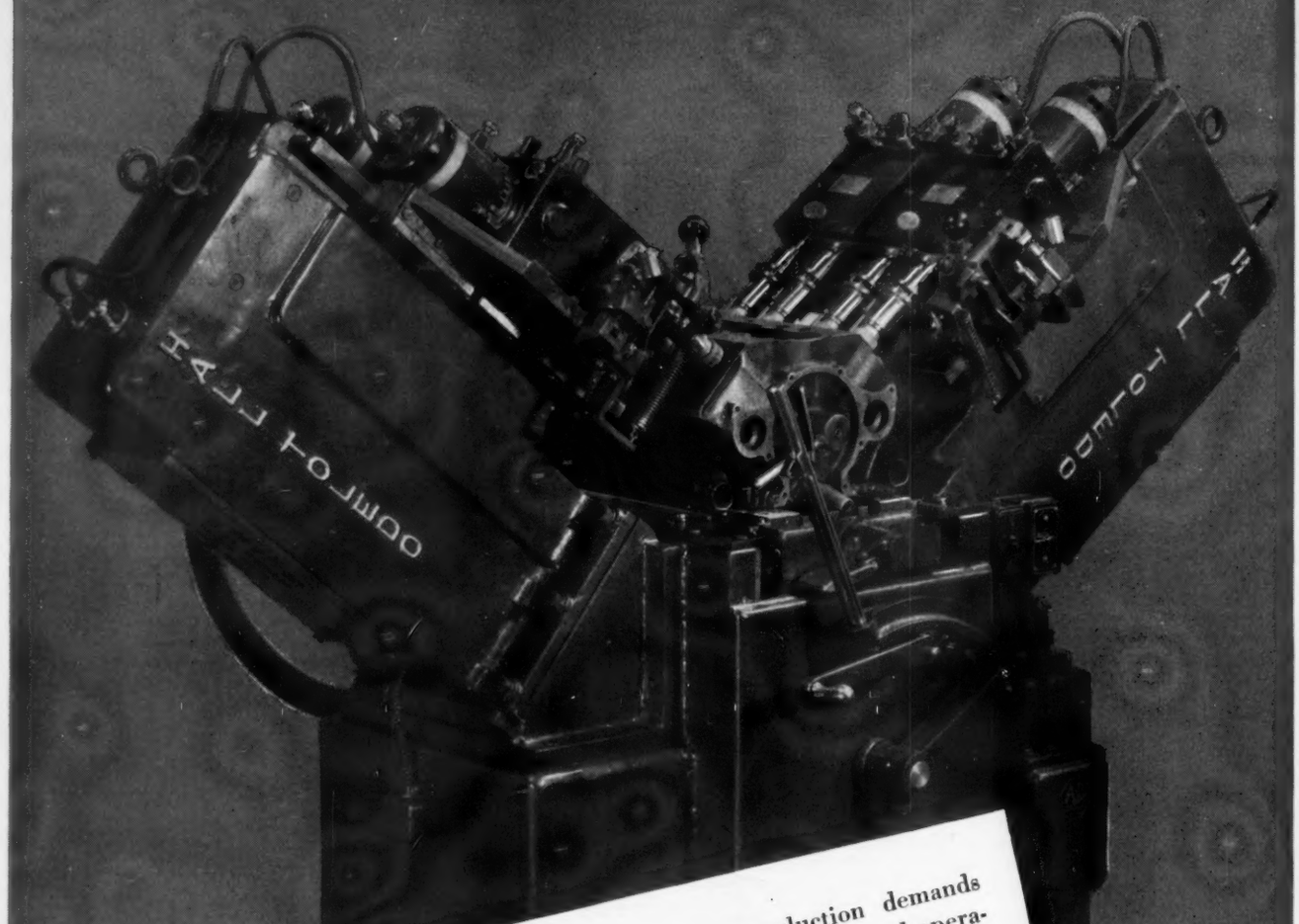
		Number of companies	Items	Annual Capacity Gross tons	Production for Sale—Gross Tons: Current Quarter: Total	Current Quarter: Per cent of capacity	Current Quarter: Shipments: Export	Current Quarter: Shipments: To members of the industry for conversion into further finished products	To Date (6 Mos. 1937): Total	To Date: Per Cent of capacity	To Date: Shipments: Export	To Date: Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	30	1	x x x x x x x	1,054,688	x x x	90,470	642,359	2,095,024	x x x	103,836	1,341,366
	Heavy structural shapes	9	2	4,739,805	810,703	68.4	37,552	-	1,517,848	64.0	65,820	x x x x x x x
	Steel piling	4	3	264,800	32,997	49.8	1,001	-	56,009	42.3	2,481	x x x x x x x
	Plates—Sheared and Universal	22	4	6,335,219	883,747	55.8	80,215	8,998	1,692,887	53.4	135,003	15,756
	Skelp	7	5	x x x x x x x	221,989	x x x	34,022	115,978	396,659	x x x	43,146	233,688
	Rails—Standard (over 60 lbs.)	4	6	3,575,000	448,883	50.2	8,677	-	864,789	48.4	10,418	x x x x x x x
	Light (60 lbs. and under)	6	7	433,500	29,643	27.4	4,601	-	62,907	29.0	6,821	x x x x x x x
	All other (Incl. girder, guard, etc.)	2	8	140,000	15,867	45.3	4,094	-	31,032	44.3	5,337	x x x x x x x
	Splice bar and tie plates	15	9	1,472,193	153,333	41.7	2,435	-	340,232	46.2	3,087	x x x x x x x
	Bars—Merchant	41	10	x x x x x x x	1,123,568	x x x	26,198	137,630	2,320,013	x x x	43,625	278,355
	Concrete reinforcing	29	11	x x x x x x x	255,043	x x x	9,572	-	450,182	x x x	16,350	x x x x x x x
	Cold finished—Carbon	18	12	x x x x x x x	185,883	x x x	1,430	-	390,700	x x x	2,738	x x x x x x x
	Alloy—Hot rolled	16	13	x x x x x x x	183,578	x x x	3,448	17,413	389,806	x x x	5,145	32,428
	—Cold finished	13	14	x x x x x x x	21,612	x x x	144	-	44,215	x x x	660	x x x x x x x
	Hoops and baling bands	4	15	x x x x x x x	26,533	x x x	235	-	48,179	x x x	349	x x x x x x x
	TOTAL BARS	60	16	11,651,851	1,796,217	61.7	41,027	155,043	3,643,095	62.5	68,867	310,783
	Tool steel bars (rolled and forged)	17	17	106,092	13,802	52.0	44	-	26,999	50.9	90	x x x x x x x
	Pipe and tube—B. W.	16	18	1,810,472	234,755	51.9	9,604	-	490,641	54.2	16,598	x x x x x x x
	L. W.	11	19	1,464,899	202,496	55.3	8,579	-	408,442	55.8	13,245	x x x x x x x
	Electric weld	3	20	586,107	46,483	31.7	17	-	106,607	36.4	382	x x x x x x x
	Seamless	15	21	2,772,828	435,945	62.9	21,863	-	873,073	63.0	44,877	x x x x x x x
	Conduit	7	22	155,270	20,063	51.7	746	-	45,132	58.1	1,400	x x x x x x x
	Mechanical Tubing	5	23	188,800	34,920	74.0	1,456	-	69,283	73.4	2,763	x x x x x x x
	Wire rods	19	24	x x x x x x x	200,961	x x x	10,654	71,158	412,334	x x x	21,538	143,036
	Wire—Drawn	38	25	1,889,827	336,173	71.2	16,743	6,168	705,979	74.7	31,973	13,527
	Nails and staples	19	26	1,123,793	148,394	52.8	7,714	-	320,651	57.1	14,264	x x x x x x x
	Barbed wire and fence	17	27	1,181,008	122,024	41.3	9,811	-	254,738	43.1	19,958	x x x x x x x
	Bale ties	11	28	114,677	18,977	66.2	95	-	31,389	54.7	153	x x x x x x x
	All other wire products	5	29	31,000	1,571	20.3	1	-	4,110	26.5	1	x x x x x x x
	Fence posts	14	30	146,800	17,605	48.0	274	-	39,501	53.8	593	x x x x x x x
	Black plate	12	31	572,229	104,699	73.2	3,182	32,763	207,354	72.5	5,837	54,702
	Tin plate	14	32	2,921,812	673,792	92.2	100,762	-	1,253,970	85.8	187,110	x x x x x x x
	Sheets—Hot rolled	19	33	x x x x x x x	574,250	x x x	24,506	14,074	1,153,889	x x x	36,742	31,421
	Hot rolled annealed	21	34	x x x x x x x	521,181	x x x	22,297	512	1,092,929	x x x	40,752	1,018
	Galvanized	16	35	x x x x x x x	331,499	x x x	20,325	-	665,557	x x x	37,555	x x x x x x x
	Cold rolled	19	36	x x x x x x x	570,140	x x x	27,128	-	1,172,275	x x x	45,633	x x x x x x x
	All other	16	37	x x x x x x x	161,500	x x x	3,584	-	326,866	x x x	7,180	x x x x x x x
	TOTAL SHEETS	29	38	10,156,927	2,158,570	85.0	97,840	14,586	4,411,516	86.9	167,862	32,439
	Strip—Hot rolled	28	39	3,474,374	589,523	67.9	17,105	88,330	1,277,322	73.5	34,411	203,368
	Cold rolled	39	40	1,200,333	210,685	70.2	1,881	-	449,989	75.0	4,631	x x x x x x x
	Wheels (car, rolled steel)	5	41	380,319	53,742	56.5	305	-	107,929	56.8	1,602	x x x x x x x
	Axles	5	42	425,900	43,541	40.9	657	-	82,193	38.6	930	x x x x x x x
	Track spikes	11	43	308,458	30,273	39.3	332	-	61,912	40.1	666	x x x x x x x
	All other	5	44	27,907	1,969	28.2	48	-	4,274	30.6	100	x x x x x x x
	TOTAL STEEL PRODUCTS	150	45	x x x x x x x	11,149,030	x x x	613,807	1,135,383	22,345,820	x x x	1,015,800	2,348,665
	Estimated total steel finishing capacity based on a yield from ingots of 70.9 %	-	46	47,401,500	x x x x x x x	84.5	x x x x x	x x x x x x x	x x x x x x x	84.4	x x x x x x x	x x x x x x x
Iron Products	Pig iron, ferro manganese and spiegel	31	47	x x x x x x x	1,595,905	x x x	112,704	484,689	3,251,907	x x x	152,158	967,546
	Ingot moulds	4	48	x x x x x x x	93,209	x x x	1,067	-	216,238	x x x	2,574	x x x x x x x
	Bars	13	49	237,019	18,804	31.7	25	337	38,803	32.7	131	548
	Pipe and tubes	4	50	185,457	13,778	29.7	145	-	32,501	35.0	361	x x x x x x x
	All other	4	51	113,660	4,398	15.5	743	787	12,058	21.2	1,643	1,589
	TOTAL IRON PRODUCTS (ITEMS 49 to 51)	16	52	478,176	36,980	30.9	913	1,124	83,362	34.9	2,135	2,137

Total companies included 174

Adjustments have been made by several companies in their annual capacity and production to date figures for certain classes of products.

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current quarter 10,013,647 *G.T.;* 84.5 *% of Finishing Capacity.*
To date 19,997,155 *G.T.;* 84.4 *% of Finishing Capacity.*
The above tonnages represent 70.9 *% of the ingots produced by companies whose products are included above.*

Speed -- plus Accuracy!



MODERN mass production demands high speeds—but, high speed operations must be performed with great accuracy in order to achieve the exacting standard of quality required. The Hall eccentric multiple spindle valve seat grinder finishes sixteen valve seats in approximately sixty seconds. . . . Fast work, but very accurate, because machine and spindles are completely equipped with New Departure Ball Bearings—recognized throughout industry as the finest that mastery of the bearing art can produce.

NEW DEPARTURE Ball Bearings

New Departure · Division General Motors Corporation · Bristol, Connecticut

NOTHING ROLLS LIKE A BALL

MIRRORS OF MOTORDOM

BY A. H. ALLEN
Detroit Editor, STEEL

DETROIT

A QUICK glance at the automobile assembly picture as of this week shows the lineup to be approximately as follows:

Down for changeover to new models: Pontiac, Olds, Buick, Cadillac-LaSalle, Lincoln, Graham, Nash, Packard and Studebaker.

Probably closing late this week: Chevrolet, Dodge, DeSoto, Chrysler, Hudson-Terraplane.

Likely to continue for a period: Plymouth, Ford, Willys.

The latter may not sustain operations much beyond two weeks; thus by the end of the month 1937 assemblies for all practical purposes can be considered completed and the first trumpets announcing the parade of the 1938 models will be heard.

Shutdown Periods Vary

Extent of the shutdowns will vary considerably, ranging anywhere from two to six weeks. Chrysler divisions will suspend for only about two weeks, Hudson not longer than three weeks. Olds dealers in Detroit say they will have new models to show by Sept. 17. Studebaker is showing new jobs privately this week. Buick and Pontiac dealers are looking for their new stocks before the end of September. Ford is planning only about five days' production of old models in September.

So carefully has production been gaged this year dealers in general find themselves with no excess stocks and, in fact, short of some body styles. In the last week or two the used car market has weakened perceptibly, probably due to the waning season, and prices are averaging from $10 to $15 off from levels of earlier in the summer, despite the effect which increased prices on new cars have had on used car values. Some dealers are looking for further markups on 1938 price tags. A Pontiac outlet, for example, expects a further $50 increase, which would bring the net rise over a month ago to about 10 per cent.

Further developments in the Chrysler expansion are seen in the corporation's purchase of 13 acres adjoining the north end of its Highland Park plant. This land at present is a part of the Oakland avenue public golf course which at the end of the current season will find itself short of nine holes. Chrysler has made no announcement as to what it proposes to build on this property, but, putting two and two together, some observers already see a new plant for building the smaller Keller car which now is reputed to be on the boards.

Incidentally, there is speculation as to the effect introduction of a new low-priced car ($450-$500) in the Chrysler line will have on values of used cars in the Plymouth-Dodge-De Soto class in the hands of Chrysler dealers.

Chrysler announced last week the purchase for a reported $275,000 of the old Fort-McKinstry plant of Graham-Paige on West Fort street. The structure, once used by Graham for body assembly, had been leased to Chrysler for a number of years for storage and with the sale of the property rumors naturally developed that Chrysler was intending to begin manufacturing operations there, but according to present information the building will continue to be used only for storage of materials and parts.

Cadillac Installs New Presses

Contract for construction of the new Dodge truck plant on Mound road between Eight-Mile and Nine-Mile roads has been awarded to Albert Kahn Inc.

Rounding out its equipment buying program, Cadillac has installed some new presses for work on 1938 models which will be coming from the assembly line soon. A feature of the new line will be a redesigned hood which lifts upward from the front, supplanting the present two-piece construction. A counterbalancing mechanism will facilitate the lifting.

STEEL purchases for automobiles are holding steady, with little buying for "floats" having developed, Chevrolet being one possible exception. Within the next two weeks releases should show sharp improvement, although practically all steel suppliers in this district report August business above normal. Bids on about 10,000 tons of reinforcing bars for sewer construction by the city were opened last week, this being the first major tonnage of this product up for bids in some time.

Trend Is to Lower-Alloy Steels

As pointed out in this department several times before, the trend in selection of steels for automobile construction at the moment is headed in the direction of lower-alloy material. Thus, in hypoid gears, a change was made from the S. A. E. 4600 series to the 4100 series, with a consequent saving, and now tests are being carried out with the idea of substituting a steel in the S. A. E. 1300 series, still further saving in cost. The latter is a high-manganese (1.60-1.90 per cent) steel which takes the alloy base price but has a considerably lower alloy differential.

Close students of these trends believe efforts will continue to be pushed to adapt the lower-alloy steels where they will provide at least equal performance characteristics, and as long as general automotive design remains as it is. But within the next four or five years, the industry likely is going to change to engines in the rear, a construction which will demand lighter steels, both in the engine and in transmission and differential. The only answer is higher-alloy material and the trend will be reversed when engines are moved rearward.

Rear engines also may bring the end of hypoid gears, since the need

MIRRORS OF MOTORDOM

for a low driveshaft which present bodies have imposed will be dispensed with and differentials can either be worm drive or the former type of ring and pinion gear.

Hypoid gears have been indicted by more than one engineer from the standpoint of lubrication maintenance. This type of gearing requires an extreme-pressure lubricant and care must be taken not to mix two types of lubricants which react and liberate free acid. Lubrication complaints on hypoids have been concentrated mainly in farm areas where drivers do not appear to be any too cautious about lubrication matters.

Steelmakers with only limited facilities for alloy production naturally have been pleased to note a trend to lower alloy material which can be supplied more readily. On the other hand, a change to these lower alloys usually is accompanied by an increase in manufacturing difficulties. This is attributed to the ability of alloys to "wash out" the effect of a spread in carbon content.

In a high-alloy steel, a spread of 10 points in carbon content may make no difference in machining qualities of two heats of steel, while in a carbon steel, for example, a difference of this much in carbon content might gum up a machining department in short order.

COMPETITION between chromium plating and stainless steel for automobile applications has lost none of its zest, and experiments are constantly under way to determine the relative merits of the two materials. Recently one manufacturer was approached with the idea of changing from chrome-plated brass to stainless steel hub caps.

A test car was equipped with two of the former and two of the latter and driven over the gravel road of a proving ground for a distance of some 7500 miles. Under steady impact of the road material, the chrome-plated brass caps were hammered loose from their steel backing and had to be held on with adhesive tape, while the stainless caps were unharmed beyond a few scratches and dents.

The test was continued a few thousand miles further and still the stainless caps were comparatively unscathed. In the face of such a favorable test, it might be imagined a change would have been approved to the 18-8 stainless material, but two objections worked against such a switch. First, and most important, the stainless caps averaged ½-cent per cap more in cost than the chrome-plated brass, which brought the overall increase on a car to 2½ cents. Second, the appearance of the 18-8 material was considered to be inferior to the chromium plate. The latter objection was overcome by giving a thin coat of chromium plate over the stainless steel, but the cost factor has not been remedied as yet.

Continue Stainless Steel Experiments

Experiments are still under way on the stainless steel caps, which now are used only by Ford and Lincoln, and a change may be forthcoming eventually. What licked the stainless steel on cost was a machine recently perfected to apply a bright nickel plate and a subsequent chromium plate on the brass caps, without any intermediate buffing.

A fair tonnage of stainless steel is used on various types of moldings and hood louvres. The Olds hood louvre for this year was an assembly of rolled stainless steel sections held together by cross brackets which snapped over the horizontal sections and were bolted to the hood.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
6 mos.	2,329,528	2,594,508	2,917,420
July	345,297	451,206	†452,309
Aug.	245,075	275,934	.....
Sept.	92,728	139,820	.....
Oct.	280,316	230,049	.....
Nov.	408,550	405,799	.....
Dec.	418,317	519,121	.....
Year	4,119,811	4,616,437	.....

Estimated by *Ward's Automotive Reports*

Week ended:	
July 24	88,055
July 31	*86,403
Aug. 7	*78,736
Aug. 14	103,250
Aug. 21	93,339

	Week ending Aug. 21	Aug. 14
General Motors	32,954	41,865
Ford	26,000	26,000
Chrysler	26,600	26,900
All others	7,785	8,485

†Estimated. *Revised.

ATTENTION is being centered this week on the convention of the United Automobile Workers in Milwaukee where President Homer Martin appears to have gained the upper hand over the radical left-wing movement which cropped up in the union recently. Martin is seeking to pattern future policies of the UAW after those of the United Mine Workers, in the effort to establish more positive control over members by union officers.

Report of George Addes, secretary-treasurer of the UAW, showed a 15-month income of $1,075,000, of which $248,000 remains in the treasury and $500,000 is invested in government bonds. No membership figures were given in the report but per capita taxes of 35 cents a member per month totaled $410,383 for the first six months of the year, from which a membership figure of 195,000 may be deduced. This contrasts with Martin's estimate of present strength as 375,000.

The summary indicated President Martin received $11,521 in salary and expenses, exclusive of airplane fares. Salaries of each of the five general officers were listed as slightly over $3500 for the 15 months, while Richard T. Frankensteen, organizational director, received about $4100 in salary and expenses.

Ford Workers Not Interested

The UAW again distributed a special edition of its weekly paper in Dearborn last Wednesday to employes going to and from the Ford plant. Observers reported only about one man in ten accepted the proffered paper, and he usually discarded it after a moment's glance.

Research at the Libby-Owens Ford Glass Co., Toledo, O., has led to the introduction of a new metal product termed extrudalite which is used to fashion flat glass products together in various structural forms.

Last Saturday Oldsmobile celebrated its fortieth birthday and recalled the many great and near-great at one time associated with the company, including R. E. Olds, C. B. Wilson, Roy D. Chapin, H. E. Coffin, R. M. Owen, R. C. Hupp, W. C. Durant, C. W. Nash.

Studebaker has announced a new series of diesel-powered trucks for high-speed heavy hauling, with 6-cylinder Hercules engines and with chassis in 138, 162 and 180-inch wheelbases. The new units have two-speed, double reduction rear axles; five-speed transmission; vacuum booster brakes; viscometer on dash; 24-volt electrical system.

WINDOWS OF WASHINGTON

BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

AS THE end of the first session of the seventy-fifth congress approached last week there was much talk on Capitol Hill to the effect that the President might call an extra session to convene in November and some observers were even guessing October.

There is some reason for expecting a special session. It is based upon the fact that next year at this time elections will be near, which means that most of the members of congress have to get back home and away from Washington to mend their political fences. This signifies that congress probably will adjourn early next spring and if much work is to be accomplished it will be necessary to get an early start. If an extra session is called it will naturally merge directly into the second session of this seventy-fifth congress, which convenes early in January.

The President last week signed the Miller-Tydings resale price maintenance bill, which was a surprise to many, especially in view of the fact that earlier in the session the President had written a strong letter to Vice President Garner opposing this bill, which had the effect of stopping the bill's progress. Then, all of a sudden when the District of Columbia appropriation bill was going through the senate Senator Tydings got the bright idea of tacking the price maintenance bill on to the appropriation bill as a rider. Apparently when all eyes were turned the other way the bill slipped through and got to the President with the price maintenance rider.

JOBLESS CENSUS SHOULD SHOW IDLENESS CAUSES

National Association of Manufacturers is urging congress to enact before adjournment the proposed federal census of unemployment and to broaden its scope to include not only the extent but the character of unemployment. The chamber claims it is insufficient to know the number of persons who consider themselves unemployed without also knowing the types of persons and into what classes of employment they would normally fall. It was emphasized that once the correct problem of unemployment is determined adequate steps can be taken to deal with it. The measure has been passed by the senate and is before the house.

The statement of the association to congress says:

"It is not sufficient, however, to merely enumerate those who call themselves unemployed. If the census job is worth doing at all, and it definitely is, then it is worth doing right. And doing it right means carefully prepared questionnaires and trained enumerators to provide the answers to many of the questions that have been unanswered year after year as the nation sought to care for the needy.

"How many in any one family are to be classed as jobless? Are those without work factory workers, retail workers, office workers, farm workers, or domestic workers? Have they worked before? How long have they been without jobs?

"These are some of the questions to which answers are needed if a scientific and humane solution is to be found for the all-important problem of finding jobs or caring for those out of work.

"While manufacturing employment today is above 12,000,000 as compared with 11,000,000 in 1929, we are confident that with this new approach to the problem, new avenues will be found for giving work in private enterprises to those who desire it."

MANUFACTURERS APPROVE DEPARTMENT REVAMPING

A special committee of the National Association of Manufacturers which investigated government department reorganization has just completed its work and filed a report with the senate select committee, also looking into the same matter.

The association committee expressed the opinion there should be consolidation and reorganization of government departments. This committee said that "a functional study of government operations will reveal many inconsistencies and possibilities for improved service through consolidation and rearranging of bureaus."

The committee seemed willing to have departmental reorganization but opposed giving the President power affecting commissions and quasi-judicial bodies.

Dealing with the question of the additional six administrative assistants to the President's staff, the committee proposed that these additions be to the existing secretarial staff and not as appointees designated as executive officials. Such a method of appointment, the committee pointed out would require no congressional policy action, but possibly an increased appropriation.

TAX LAW REVISION IMPORTANT TO BUSINESS

Industry will be vitally interested at the next session of congress in tax revision, which is now being studied by tax experts of the treasury department, in preparation for the January session of congress.

Some of the problems which are being surveyed, it is understood, include modification of capital gain and loss provisions; changes in depletion allowances for income tax purposes and elimination of tax exempt features on a reciprocal basis of bonds issued by federal, state and local governments.

Other matters being looked into at present include the taxation of income in community property states; further changes to close loopholes; and the examination of pension trusts in relation to income tax.

Tax experts are also going into

the question of negotiation of treaties with foreign countries providing for exchange of information designed to minimize tax avoidance. Many other similar matters are now being studied with the idea that they can be presented to the house ways and means committee during the early part of the coming session.

NEUTRALITY LAW PROBLEM DIFFICULT TO SOLVE

There was much talk in congressional and governmental circles last week in connection with invocation of the neutrality law by the President in the Sino-Japanese war situation.

This evidently annoyed the President, because at one of his press conferences he explained why, up to the time of the conference, he had not taken action. He showed in some detail that the present Far Eastern situation is considerably different from the Italian-Ethiopian war. In that case, he explained, a state of war existed and it was not at all in the same category with the present Far Eastern question.

The neutrality act, about which there has been so much talk, was enacted April 29 this year. It stipulates that "whenever the President shall find that there exists a state of war" between nations he "shall proclaim such fact."

There is much hesitancy in declaring the fact in the Sino-Japanese case because diplomatic relations between the two countries have not been severed and no formal declaration of war has been made.

Invoking the neutrality act would automatically place an embargo against shipments of arms, munitions and implements of war from this country to either China or Japan and would prohibit travel by citizens of this country on ships of either of those nations.

It is contended by many authorities here that the invocation of the neutrality law would have a worse effect on China than on Japan because of the difference in trade volume to those nations. Also, it is contended by some that Japan would probably resent such a formal recognition of the conflict.

There is the fear in many quarters familiar with the Far Eastern commercial situation that application of this law by the President might have a very vital future effect on our trade in that section of the world, and this trade is not small in dollars and cents.

CHAMBER OF COMMERCE FOR LIMIT ON HOUR-WAGE LAW

A special committee of the United States Chamber of Commerce last week contended that correction of any hours and wages abuses that can be made by direct legislative method should be made by state legislatures and not in federal legislation.

The only federal legislation which should be undertaken, the committee declared, should be in the form of federal enactments to protect the states in the legislation which they themselves may enact, from defeat through the use of interstate commerce.

"The Chamber of Commerce of the United States", said the committee, "has repeatedly advocated wages to provide a decent living and hours of work allowing adequate earnings and ample leisure for workers."

LOSES FIGHT ON SALE OF DEMOCRATIC YEARBOOK

Minority Leader Snell of the house was voted down last week by the rules committee on his request for a thorough investigation of the sale of the Democratic yearbook autographed by the President. The vote, naturally, was partisan, ten Democrats against and four Republicans favoring it.

While Mr. Snell could not possibly have hoped that he would get an investigation under the circumstances, he doubtless obtained his objective by publicity gained through his speeches against the committee for its sale of the books and also through the exhibits which he filed at the hearing.

Snell charged that, in violation of the law governing political contributions, the Democratic committee has sold autographed books to some 900 corporations and individuals at $250 each. He told the rules committee of the house that "the exorbitant price of $250 presents, of course, an incalculably great shock to public morals." He said that $18,000,000 in fines was collectible under federal law for the sales, which he described as "disgraceful and demoralizing political racketeering."

MANGANESE PRODUCERS SEEK HIGHER TARIFF

Domestic manganese producers are bringing pressure to bear from congress and others seeking to have Secretary of State Hull increase the rate on manganese ore into the United States.

In times past domestic interests have tried to have the rate raised to 1½ cents per pound, manganese content. Under present trade agreements, it is ½-cent per pound, and all that domestic producers now ask of Mr. Hull is an increase to 1 cent per pound.

He has promised some kind of a definite answer to this request soon. He has been promising that for some time, and there has been in the minds of those interested, the idea that the secretary was merely waiting for congress to get away from Washington to make his definite announcement.

BOLT STANDARD URGED

A proposed simplification practice recommendation covering stock nominal sizes of machine, carriage and lag bolts has been sent to manufacturers, distributors and users by the simplified practice division of the bureau of standards for acceptance.

This recommendation, proposed by the American Institute of Bolt, Nut and Rivet Manufacturers, lists marginal items leaning towards stock, as well as stock items, based on results of a study made by the institute's committee on standards and technical practices.

JAPAN DROPS STEEL DUTY

The Japanese diet has approved suspension of collection of import duties by imperial ordinance last April 15 on iron, steel and iron and steel products classified under tariff item 462, and has extended the period during which these products will remain duty free from March 31, 1938 to June 30, 1939, according to a radiogram from Commercial Attache Frank S. Williams, stationed at Tokyo.

CHINA TO GET LOCOMOTIVES

Inquiry at the offices of the government import-export bank here regarding the locomotives for which this bank made loans to China, as to whether the bank will go through with the deal indicates that the locomotives are being built and as far as is known at this time they will be shipped to China when completed.

U. S. Steel Confirms Sale Of Canadian Properties

United States Steel Corp. last week confirmed sale to Dominion Steel & Coal Co. of Canadian Bridge Co. Ltd., Canadian Steel Corp. Ltd., Canadian Steel Lands Ltd., and the Essex Terminal Railway Co., all Steel corporation subsidiaries located in Canada. According to the official statement, payment is to be made in part in cash and in part in mortgage bonds and debentures to be issued by Canadian Bridge Co. Both issues will be convertible into Dominion common class B stock. Properties will be transferred Sept. 1.

These properties are dependent upon other manufacturers for their supply of semifinished steel. Canadian import duties handicap supplying such steel from the United States.

Editorial

How Synchronize School Output with Job Market?

RECENT announcements of the revival, expansion or inauguration of training courses in industrial organizations indicate that executives are keenly aware of the need of better preparation of employes for jobs under today's exacting conditions. Technological progress, changes in the functioning of industrial units, shifting concepts of social obligations, new alignments between politics and industry, more restrictive control of operations by government legislation and administration, changing relations between employer and employe and numerous other current developments have altered the requirements of most of the jobs in industry. Employers sense these changed conditions and are attempting to prepare for them.

Many of the courses they are administering will be effective. There is no question but that the training prescribed, in the majority of cases, will enhance the capacity of many employes to handle their jobs more satisfactorily. In so far as these courses affect the individuals already identified with industry, they are an important asset.

But the efficiency of the personnel of industry depends only in part upon the qualifications of existing employes. The nation's industrial army is always on the march. Veterans are retiring. Youngsters constantly are being recruited into the ranks. Inevitably, the qualifications of the younger element—the newcomers to industry—constitute a major factor in the efficiency of the army.

Too Many Youths Train for White Collar Jobs; Employment Market Can Use Only a Fraction

This brings us to a notoriously weak spot in the national educational system. The youth of America seeks education on a woefully inaccurate concept of the ultimate market for knowledge and experience. William Feather, writing in the *Pickands-Mather Magazine* for August, points out that in one typical city having a population of one million persons, 90.3 per cent of the high school pupils are preparing themselves for "white collar" or professional jobs, whereas in that city the "white collar" or professional opportunities for employment constitute only 9.3 per cent of the total. Conversely, only 9.7 per cent of high school pupils are training themselves for the type of work which engages 90.7 per cent of the city's total workers.

Assuming that the experience of this city is typical of the nation, this condition is disconcerting. It implies that the idea of working in overalls has become distasteful to an overwhelming majority of the male youths of the country.

Nevertheless, this tendency is understandable. From 1890 to 1910 millions of Europeans came to the United States to work as common laborers. Each succeeding generation descending from this stock has sought a higher standard of employment and of living. Sons of fathers who worked for $1.25 a 10-hour day edged upward in the economic and social scale when they came of age. Grandsons went to universities and thousands of them today are in important positions in industry, commerce and the professions.

Today it is a foregoine conclusion among a steadily increasing number of families that the sons will go to college. Some youths who go because their parents can afford to send them probably would have been better off if they had gone from high school into vocational training and thence into industry. On the other hand, thousands of boys now in overalls should have had the benefit of university training.

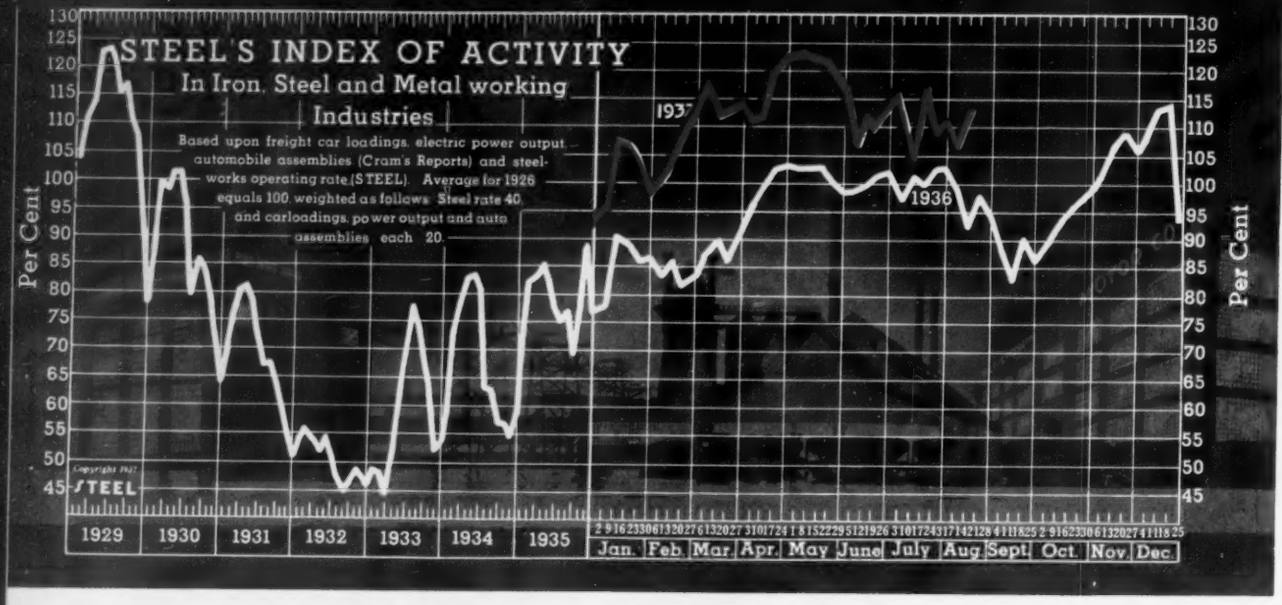
Miscast Boys Are Tragedy of Educational System; Need for Means To Match Schools and Opportunity

Industrial executives and employment managers are witnesses daily of the tragedy of miscast youth—boys whose early training or lack of it has made them unfitted for the work they want. In our intricate economic and social system there should be some way of synchronizing the product of our schools and colleges with the "job" markets in industry, agriculture and commerce.

Perhaps this is a field in which trade associations could do effective work. Some associations already are active in promoting vocational training. This is excellent, but beyond that lies the broader task of "selling" educational institutions—public and private —on the type of training which will satisfy the present "job" market.

Here is a suggestion for trade association executives who are planning their fall conventions: Why not ask a competent speaker in your field to present a carefully prepared address on "What Can Schools and Colleges Do To Prepare American Youth More Adequately for Jobs in Industry?"

Expert opinion on this subject might provide a good approach to the solution of the main problem.



STEEL'S index of activity gained 6.1 points to 113.7 in the week ending August 14:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
June 5	105.1	98.8	79.3	82.3	69.9	51.0	73.5	97.9
June 12	111.4	99.4	80.0	83.6	72.1	51.1	73.2	96.2
June 19	110.3	101.0	77.3	81.8	73.9	51.8	70.9	95.0
June 26	112.8	101 9	78.4	79.4	77.0	51.6	70.6	94.0
July 3	115.3	97.5	64.1	52.3	71.4	49.2	64.1	75.0
July 10	103.8	100.9	76.5	67.8	79.1	41.7	69.4	86.9
July 17	115.7	99.9	79.8	68.1	79.4	46.9	70.0	79.1
July 24	108.0	102.1	80.8	66.4	78.8	51.5	69.7	78.7
July 31	109.1	102.5	78.4	64.6	75.9	46.1	68.9	79.2
Aug. 7	107.6	98.7	73.4	64.6	74.7	45.1	67.0	85.6
Aug. 14	113.7*	92.6	77.5	61.4	74.2	44.6	67.4	86.2

*Preliminary.

Gains in Auto and Power Output Lift Activity Index

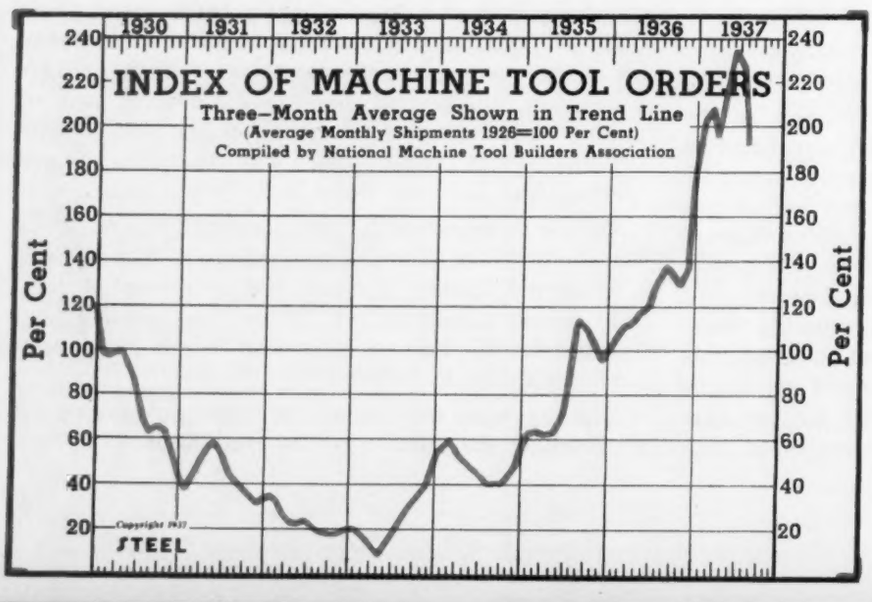
INDUSTRIAL activity in mid-August is holding to encouraging levels and, incidentally, is confirming the forecasts of industrialists who predicted that the summer recession would be mild.

Resumption of activity by Ford was responsible for a sharp increase in automobile output from 79,736 cars in the week ending Aug. 7 to 103,250 in the week ending Aug. 14. This spurt in motor car output was an important factor in the rise of STEEL'S index of industrial activity to 113.7 in the week ending Aug. 14. This represents a gain of 6.1 over the index of the previous week.

Electric power output also increased moderately to 2,300,547,000 kilowatt hours, which is a new all-time high. Significant is the fact that the increase in power consumption over that of a year ago was most pronounced in the Rocky mountain and Central industrial sections. Revenue freight car loadings were up slightly.

The gains in the three barometers more than offset a half-point drop in the rate of steelworks operations. Production is easing slightly but at the same time the volume of new orders is turning upward.

Commodity price trends continue contradictory. Weakness in farm prices has depressed some commodity price indexes, but scrap and some metals continue to edge upward.

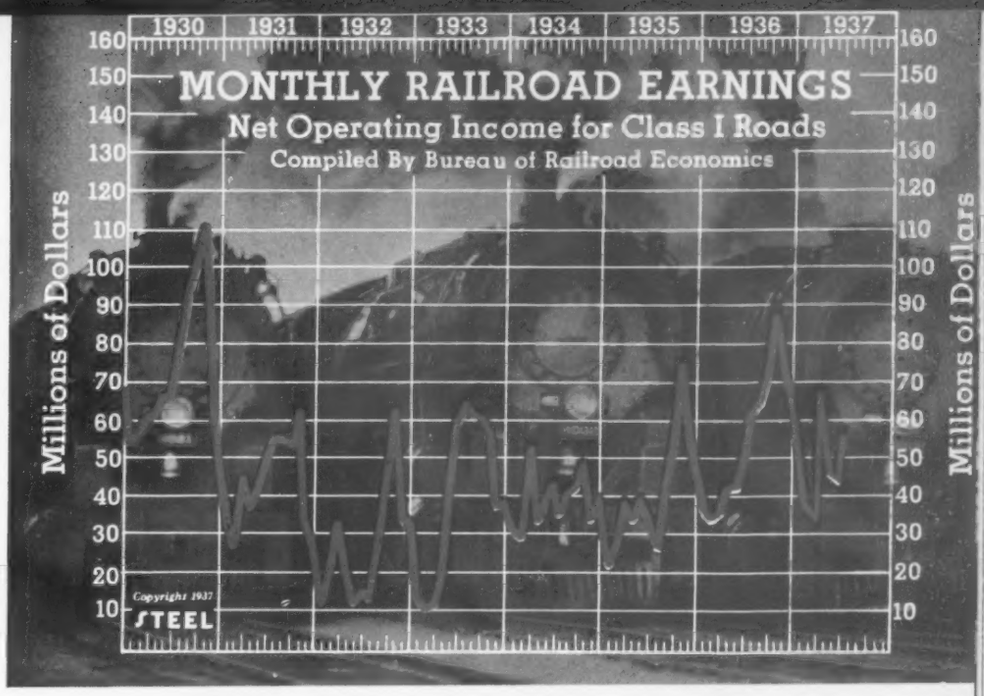


	Three-Month Average			
	1937	1936	1935	1934
Jan.	201.7	102.6	61.3	56.5
Feb.	207.7	107.1	61.5	58.2
March	192.4	109.4	60.3	50.9
April	219.8	114.4	60.3	48.5
May	234.2	116.6	67.1	46.8
June	227.6	124.5	76.7	42.6
July	190.5	132.6	94.7	38.6
Aug.	.....	135.5	112.2	37.1
Sept.	.....	132.0	108.5	37.4
Oct.	.....	127.5	102.9	40.5
Nov.	.....	134.0	93.8	44.2
Dec.	.....	180.4	89.9	54.1

BUSINESS TREND

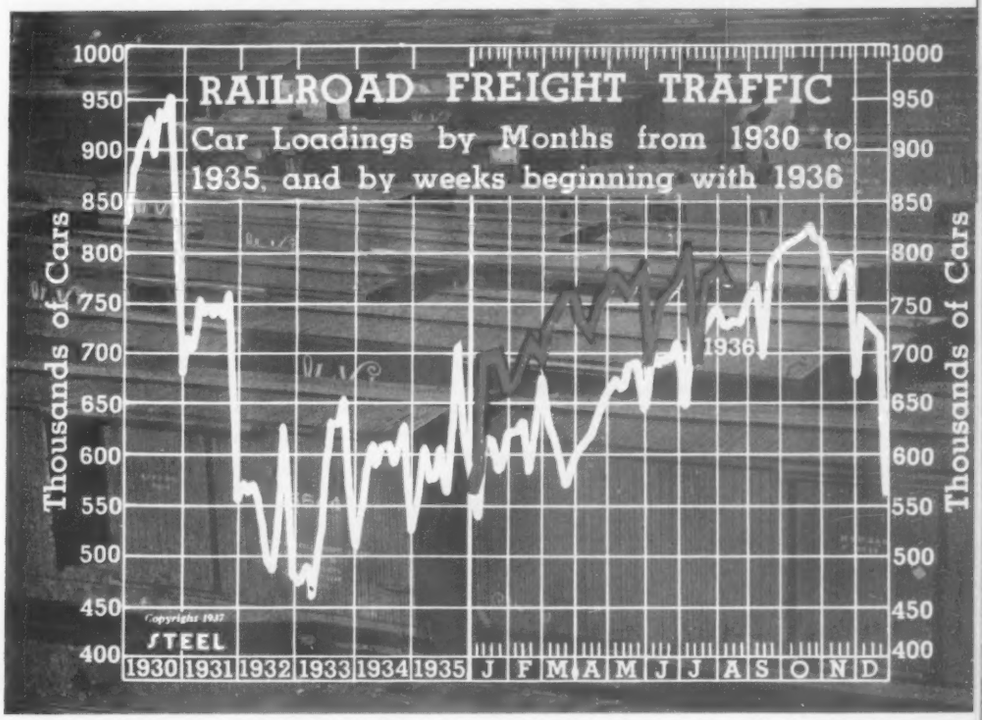
June Railroad Earnings Continue Sharply Upward

	1937	1936	1935
Jan.	$38,436,679	$35,728,532	$21,934,645
Feb.	38,358,638	33,594,718	26,296,411
March	69,379,328	35,205,513	38,129,871
April	47,807,447	41,493,455	34,708,718
May	43,662,959	41,797,047	39,598,511
June	58,939,875	50,312,580	34,102,703
July	.....	61,773,765	26,919,343
Aug.	.....	64,680,717	42,156,706
Sept.	.....	70,166,026	57,349,265
Oct.	.....	89,851,409	75,454,501
Nov.	.....	72,410,571	54,224,290
Dec.	.....	70,519,601	46,020,695


MONTHLY RAILROAD EARNINGS
Net Operating Income for Class I Roads
Compiled By Bureau of Railroad Economics
Millions of Dollars
1930 1931 1932 1933 1934 1935 1936 1937
Copyright 1937 STEEL

Railroad Freight Traffic In Slight Seasonal Drop

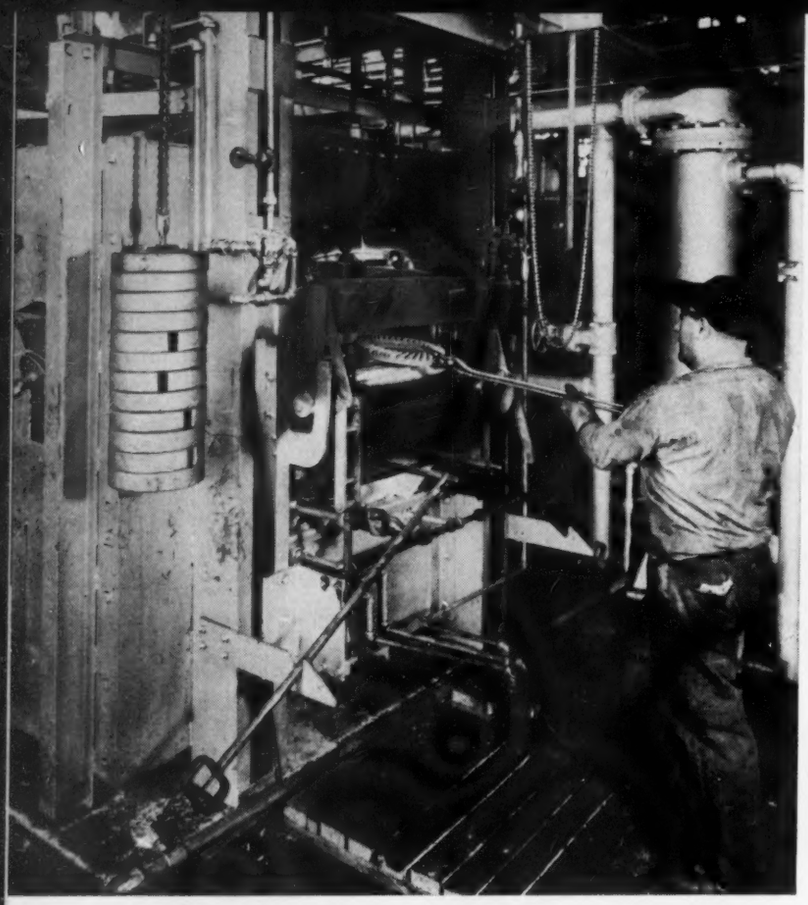
	1937	1936	1935
Aug. 7	769,706	728,293	583,743
July 31	782,660	747,551	597,083
July 24	770,980	731,062	596,462
July 17	770,075	729,402	593,366
July 10	682,205	724,324	566,488
July 3	806,168	649,759	472,421
June 26	773,733	713,639	618,036
June 19	756,289	690,716	567,847
June 12	754,360	686,812	653,092
June 5	692,140	695,845	630,836


RAILROAD FREIGHT TRAFFIC
Car Loadings by Months from 1930 to 1935, and by weeks beginning with 1936
Thousands of Cars
1936
1930 1931 1932 1933 1934 1935 J F M A M J J A S O N D
Copyright 1937 STEEL

Steel Corp. Shipments Down 81,798 Tons in July

	Gross Tons		
	1937	1936	1935
Jan.	1,149,918	721,414	534,055
Feb.	1,133,724	676,315	583,137
March	1,414,399	783,552	668,056
April	1,343,644	979,907	591,728
May	1,304,039	984,087	598,915
June	1,268,550	886,065	578,108
July	1,186,752	950,851	547,794
Aug.	.....	923,703	624,497
Sept.	.....	961,803	614,933
Oct.	.....	1,007,417	686,741
Nov.	.....	882,643	681,820
Dec.	.....	1,067,365	661,365

MONTHLY FINISHED STEEL SHIPMENTS
By U. S. Steel Corp.
Thousands of Tons
1930 1931 1932 1933 1934 1935 1936 1937
Copyright 1937 STEEL



Continuous Gas Automotive

BY R. W. ROUSH

Chief Metallurgist,
Timken-Detroit Axle Co., Detroit

OPERATOR removing a carburized gear through slot door in holding or discharge chamber of furnace. It is quickly wire brushed and placed in oil quenching press

FOR continuous gas carburizing of automotive rear axle ring gears, Timken-Detroit Axle Co., Detroit, has installed a 38-foot furnace with a number of unusual features for this type of work. Built by Surface Combustion Corp., Toledo, O., the unit is the second of its type to be installed at the plant, the first having been in operation for about five years.

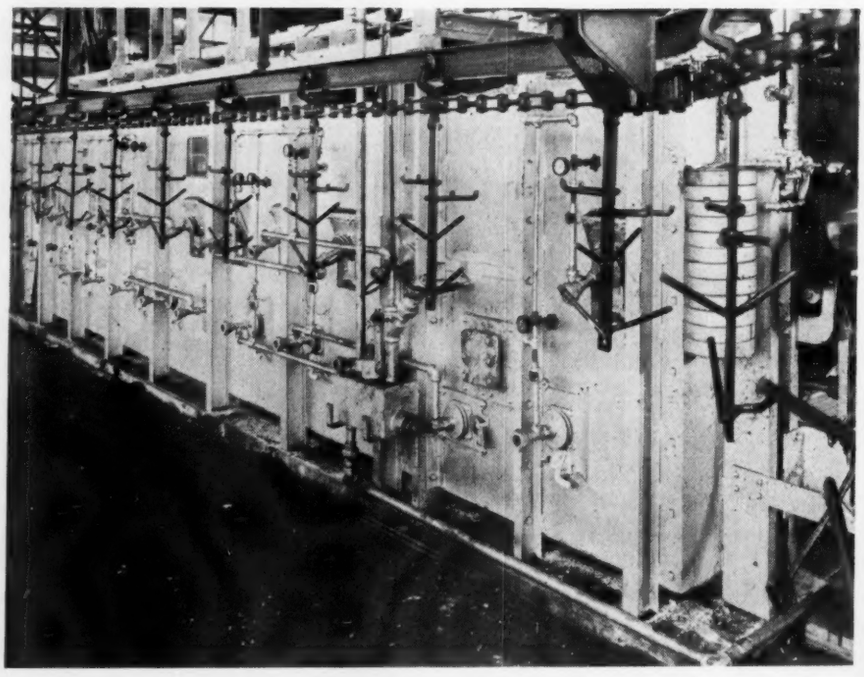
The new furnace has a 26-foot welded alloy steel muffle, 31 inches in width and 12 inches in effective height. Top is arched and working height is considered as the distance from the base to the low point of the arch. The muffle is made in eight sections of ½-inch wall thickness welded together and supported on rollers which in turn rest on refractory piers, allowing for expansion and contraction.

The muffle is both over and underfired on two sides through 44 high-pressure natural gas burners to provide maximum uniformity of heat distribution, the top burners set on an angle of about 20 degrees. Bottom burners fire between the refractory piers supporting the muffle. Walls of the furnace comprise a layer of firebrick and an outer casing of insulating firebrick, all supported between welded steel plates and buckstays. Roof is arched to conform with the muffle arch, and surmounting the structure is a catwalk and handrail to provide access to the valves and other mechanism on the roof of the furnace.

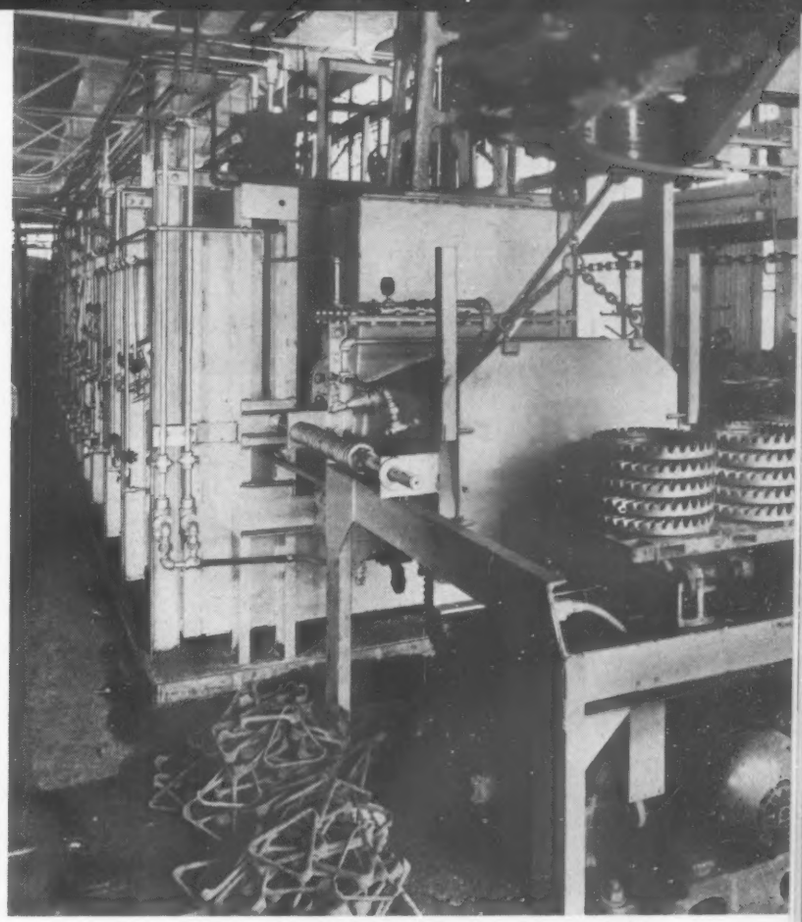
One unusual feature of the unit is that carburizing gas is admitted through six separate inlets—one at the charging end and five along the top—instead of through the former single inlet at the charging end of the furnace.

The carburizing gas is produced by the cracking of approximately 1.2 parts of air to 1 part of Detroit natural gas in a double C. G. natural gas cracking unit, consisting of three 4-inch tubes, 12 feet long, passing through a furnace heated to 1850 degrees Fahr. After passing through a cleaning tower and a cool-

SIDE view from discharge end of gas carburizing furnace, showing arrangement of burners firing over and under the muffle. Monorail conveyor supplies ring gears from machining department and removes carburized gears to finishing division



Carburizing of Ring Gears



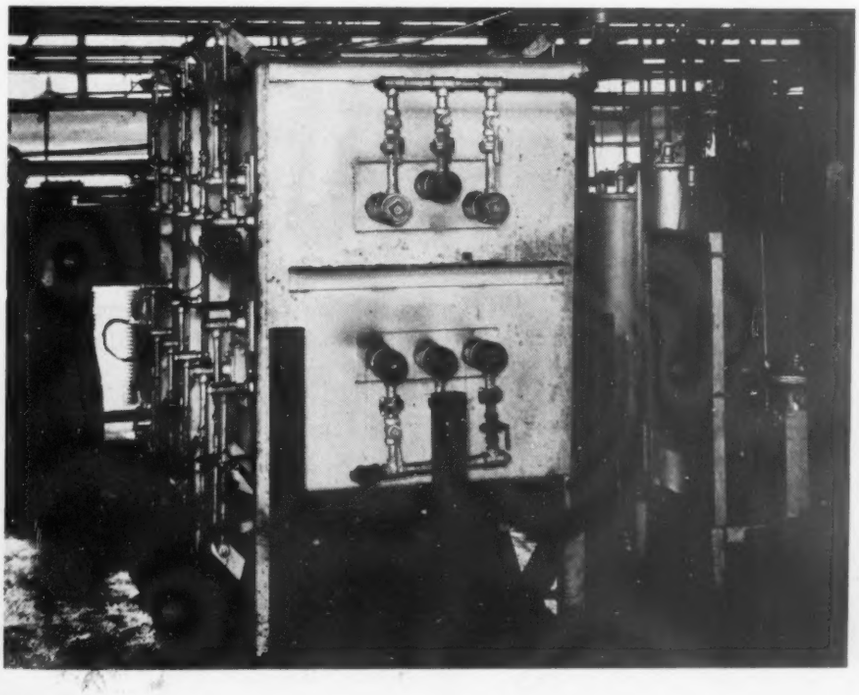
CHARGE of ring gears ready to be pushed into preheat chamber before admission to furnace proper. Below is gravity dog type pusher which moves loaded trays through muffle. Note pneumatically controlled baffle door between preheat chamber and muffle

ing tower, this gas has the following composition:

	Per cent
Carbon monoxide	16.0-19.0
Methane	10.0-15.0
Hydrogen	30.0-35.0
Nitrogen	30.0-40.0
Carbon dioxide	0.3- 0.5
Oxygen	0.0

It is brought from this C. G. or cracking unit, mixed with certain definite proportions of raw natural gas and then directed into a manifold along the top of the furnace and through distributing valves to the inlets. Adjustment of these valves is made so that the proper amount and proportion of gas will be admitted through the inlets to maintain the desired balance in the different zones of the furnace. This gives considerably more accurate control over carburizing conditions in the furnace.

DOUBLE cracking unit of C. G. type which supplies carburizing gas to muffle of two furnaces



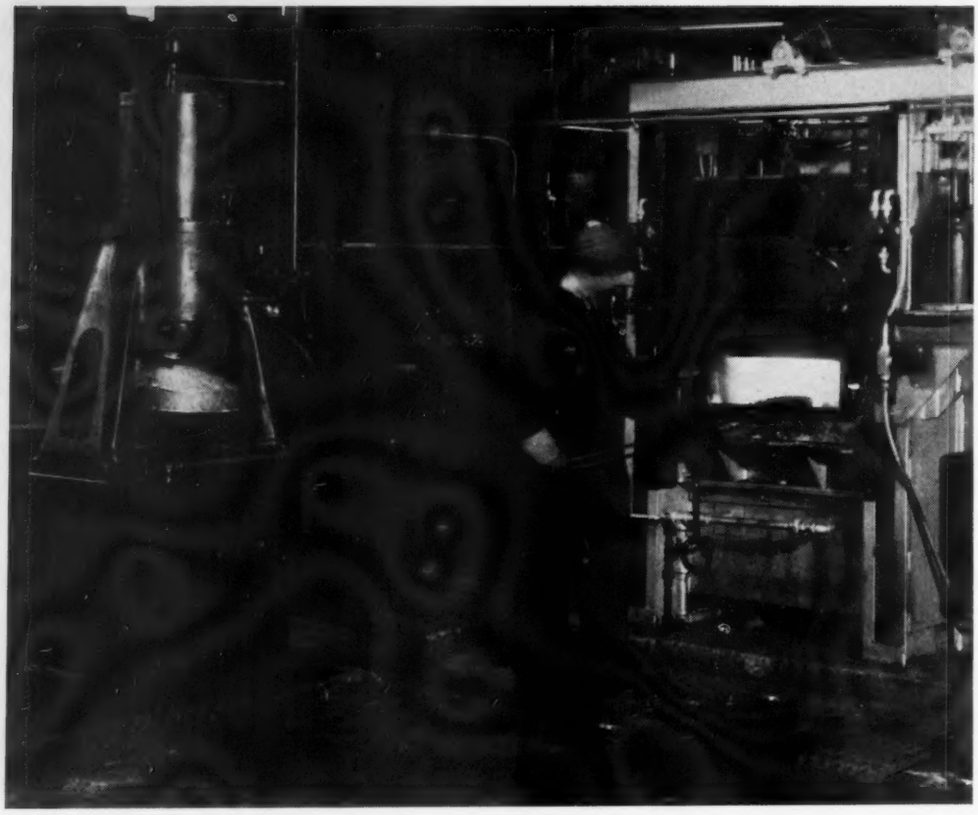
Composition of the gas entering the muffle is as follows:

	Per cent
Carbon monoxide	12.0-15.0
Methane	23.0-28.0
Hydrogen	38.0-42.0
Nitrogen	17.0-27.0
Carbon dioxide	0.0- 0.2
Oxygen	0.0

Carburizing gas passes out of the furnace through a water seal and into the open air where it is burned. Thus a positive atmosphere gas pressure on the muffle is maintained at all times. Rate of flow is 200-300 cubic feet per hour.

At either end of the muffle is a pneumatically controlled valve door, comprising two vertical plates connected by a toggle arrangement and sliding in a wedge-shaped frame. These doors open onto vestibules or small chambers at either end of the furnace, the latter being closed tightly and forming a seal on the muffle. At the charging end the vestibule is purged by four gas burners, two on either side, the vestibule being closed by a manually operated outer door. This changer acts as a preheat for the charge before it is admitted to the muffle.

At the discharge end, the heated vestibule receives the trays of carburized gears as they emerge from the muffle through a so-called hot



QUENCHING press is shown at the left, with an operator removing a gear from the discharge end of No. 1 carburizing furnace

valve, similar to the valve door at the charge end. The outer door at the discharge end is not raised entirely for removing the hot gears, but instead has a narrow section of slot door which moves independently of the rest of the door. Trays of stacked gears are moved up next to this door, and onto a platform within the holding zone muffle which can be raised through a rack and pinion drive arrangement so that the top gear on the stack is level with the slot and can be removed by tongs for quenching. By this means the gears can be taken from the furnace without exposing too great a door area at the discharge end, thus preventing drop in temperature and infiltration of outside air.

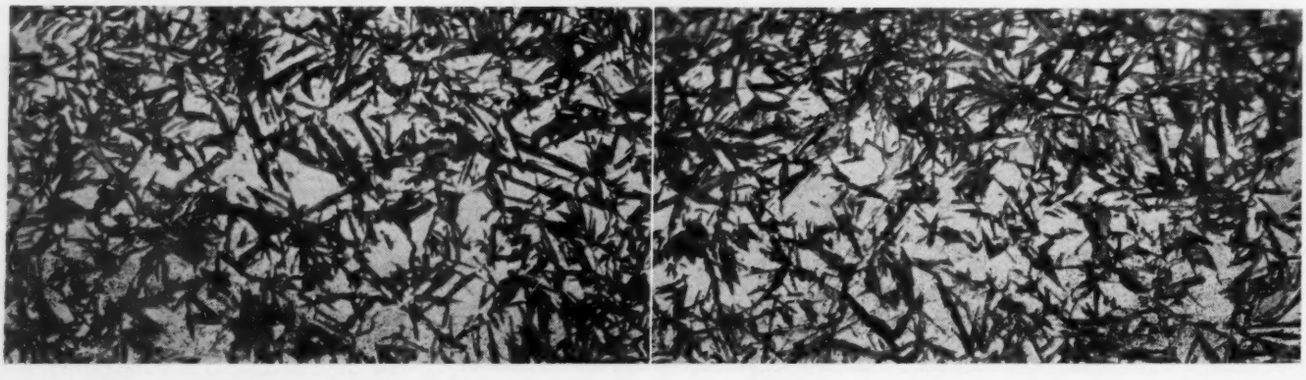
Gears are of S.A.E 4620 steel (0.18-0.23 carbon, 0.40-0.70 manganese, 1.65-2.00 nickel and 0.20-0.30 molybdenum) and are received for carburizing after being normalized, machined and tested for accuracy. They are stacked, teeth up, on heat-resisting alloy steel grids or trans in two piles of five each, with triangular spacers placed between the gears to prevent contact. Ring gears vary somewhat in diameter for different cars, but an average size is about 13-inch diameter, weighing somewhere near 20 pounds. Trays travel crosswise through the furnace, sliding on three raised rails cast integrally with the floor of the muffle. Guides on the bottom of the tray keep it in proper position on the rails.

A typical charge figures out to about 200 pounds for the gears and 62 pounds for the spacers and grid. The furnace is operated on cycles of about 27 minutes and the sequence of operations is as follows:

The hot valve door is raised and by means of pull-out bars, operators pull a tray of carburized gears into the vestibule at the discharge end. The valve door then is closed and the elevator mechanism actuated to bring the top gears on the stack into position for removal. The hot gear is removed by tongs, wire brushed with a portable electric brush to remove any carbon deposit, and then placed in a Gleason quenching press in which the gear is held firmly between dies and lowered mechanically into an oil bath, oil under pressure being forced up through slots in the lower die to speed the quenching. Six such presses serve two carburizing furnaces, the latter being erected in line and with discharge ends of the furnaces.

After the ten gears on a single

PHOTOMICROGRAPHS of case on teeth of two gears. Etched in 4 per cent nital. X500



tray are quenched, the valve door at the charging end is opened. A loaded tray already has been in the preheat chamber about 15 minutes and by means of a gravity dog type pusher is moved into the muffle of the furnace. The pusher is powered by a 5-horsepower motor and makes three strokes to move one tray of gears into the muffle. In so doing, of course, the pusher must move all the trays in the muffle ahead by the width of a single tray.

Next the valve door at the charge end is closed, the outer door opend, and a loaded tray of gears pushed over a roller table into the preheat vestibule. As mentioned before, the cycle between the time one tray is pushed into the muffle and the time the next one is admitted is about 27 minutes. Length of the furnace is such that it requires 11 hours for a load of gears to pass clear through the muffle.

Temperature in the muffle is held at 1750 degrees Fahr., regulated by three thermocouples in the carburizing chamber connected to indicating and recording pyrometer controls. Roughly the muffle is considered to have three zones—preheating, carburizing and diffusing—distinguished by the amount of carburizing gas being admitted to each. A fourth pyrometer control is installed in the quench or holding chamber to insure against excessive temperature chamber is maintained at or close to furnace temperature, pressure on the gas supply being sufficient to prevent any air infiltration through the slot door.

Carbon Content of Case On Three Samples

Cut	Total	Sample 1	Sample 2	Sample 3
—inch—		—Carbon, per cent—		
0.005	....	1.20	1.19	1.18
0.005	0.010	1.16	1.15	1.14
0.005	0.015	1.10	1.10	1.08
0.005	0.020	1.06	1.01	1.01
0.005	0.025	0.99	0.96	0.94
0.005	0.030	0.90	0.91	0.87
0.005	0.035	0.85	0.86	0.79
0.005	0.040	0.76	0.72	0.70
0.010	0.050	0.68	0.63	0.61
0.010	0.060	0.52	0.55	0.48
0.010	0.070	0.38	0.45	0.36
0.010	0.080	0.27	0.30	0.26

Furnace conditions are set to produce a case on the gears of 0.060 to 0.075-inch, depending upon the size of the gear, measured on a hardened cross section of a gear tooth. Uniformity of case depth is maintained on the top, side, between the gear teeth, and around the gear, regardless of the position of the gear on the tray.

Carbon content of the case is shown in an accompanying table of analyses taken on samples carburized in different positions on the tray. Cuts of 0.005 and 0.010-inch were made, as indicated for each determination.

The type of crystalline structure is shown in accompanying photomicrographs, taken at the surface of teeth from different gears. A considerable amount of austenite is present but due to the high carbon content and the equal distribution of interlocking crystals of martensite, absolute file hardness is obtained on tooth surfaces. The Rockwell hardness on the surface is C-60 or higher. Even though a gear is rejected when one tooth can be scratched by the best file, the percentage of rejections in this inspection is below one per cent. The gears are held within close limits for out-of-round and out-of-flat, with few rejections.

After quenching, the gears are suspended from hooks on an overhead chain conveyor and moved through an alkali washing chamber, in which sprays are directed so as to remove thoroughly all traces of quenching oil. Taken off the conveyor, each gear is inspected visually, checked for distortion and each tooth tested for file hardness. After these tests the gears are placed back on the conveyor and transferred to the machining department where they are finished.

Elementary Foundry Technology Text Revised

Elementary Foundry Technology, edited by L. A. Hartley; second edition by Edwin Bremer and Pat Dwyer, metallurgical and engineering editors, respectively, *The Foundry;* 375 pages, 6 x 9 inches, cloth; published by Penton Publishing Co., Cleveland, and supplied by STEEL, Cleveland, for $3, and in Europe by Penton Publishing Co. Ltd., London, England.

This text on elementary foundry technology with special reference to gray iron and steel, designed to serve the foundry in schools and in industry, conforms to the requirements for instruction as set up in the minimum standards of four year foundry apprenticeship in the United States. Co-ordination of material from different fields has been well balanced to meet the need of vocational schools and of practical foundrymen in the shop.

Subject matter selected from elementary physics and chemistry is broad enough in scope to furnish a foundation for the contributions of the technical experts. The text is plain and simple. A young student, with only a little knowledge of chemistry, readily will understand the applications presented. A list of questions following each chapter has been designed to test the foundry knowledge and reasoning power of the student, rather than his ability to memorize the text.

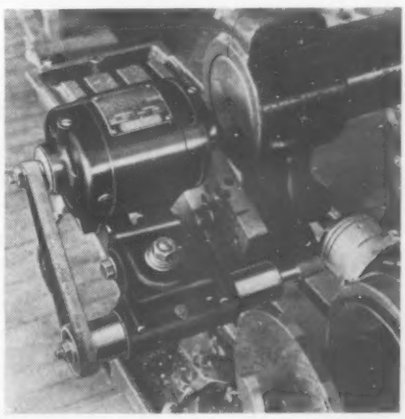
General impression of the field covered may be gathered from the following list of main divisions: Substances and their structure; physical properties; oxidation; reduction and combustion; force and motion; application of force; mechanics of fluids; effects of elements on iron; iron; melting devices; foundry sands; the steel foundry; crucible, bessemer, open hearth, electric; molding machines; permanent molds; gates and risers.

A glossary, index and bibliography add considerably to its value as a text book. The book has been completely re-edited, revised and enlarged to a considerable extent by the addition of new material. The book is sponsored by the National Founders association, Chicago.

Mercury Switch Makes Oiling System Foolproof

Printing presses built by the Miller Printing Machinery Co., Pittsburgh, are equipped with an automatic oiling system by which oil is fed at 150 pounds pressure to every main and high speed bearing. To make this system foolproof, a mercury switch has been installed. This stops the press instantly if the tank of the oilng system runs dry and the machine cannot again be started until the tank has been refilled. This feature automatically prevents hot or seized bearings.

Mills Spiral in Aluminum



TO MILL economically a spiral in 50 aluminum end caps this precision portable mill grinder was chucked into the grinding quill by a Racine, Wis., shop foreman confronted with the problem. Set-up was easily made and job worked out because cutter was driven at the correct work speed for milling aluminum. Equipment included a Dumore No. 5 grinder with "D" quill, Milwaukee miller and a ⅛-inch fishtail milling cutter

Improving Chilled Car Wheels

Laboratory research on chilled car wheels has led to the perfection of an improved heat treating method resulting in uniform strength increase

BY S. C. MASSARI
Metallurgist, Association of Manufacturers of Chilled Car Wheels, Chicago

ALTHOUGH the chilled car wheel industry is one of the oldest metallurgical industries in existence and has reached a high state of perfection, it still realizes the necessity for diligent and continued research of a high caliber further to improve its product so as to withstand the punishment that wheels must endure in service. To meet this need, the industry has established a complete modern laboratory for the purpose of investigating all problems of a technical and metallurgical nature concerning wheel manufacture and service.

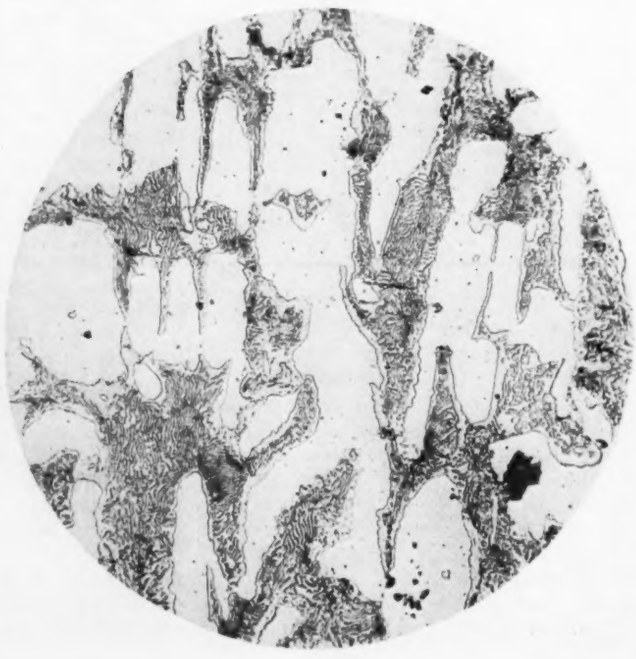
This laboratory organization has functioned for the past 15 years and specifically devoted almost its entire time during the last 3 years to investigating the possibilities of improving the chilled car wheel by heat treating methods. It is more particularly this phase of the work which will be described because of the marked improvement in the product which has been accomplished.

The necessity for the heat treatment of chilled car wheels arises from two principal sources:

1. The total relief of internal casting stresses, so that the metal in the finished wheel will possess its full potential strength.
2. A modification of the as-cast structure of the chill which will increase its resistance to impact failure and temperature gradients resulting from brake-shoe application.

The internal stresses in a car wheel originate from two sources, namely, differences in cooling rate between the various parts of the wheel and the markedly greater shrinkage of chill as compared with

FIG. 1 (left) at 100 diameters and Fig. 2 (right) at 400 diameters are typical of chill which has been poorly heat treated. The massive primary carbides are coarse and the matrix consists of distorted lamellar pearlite



mottled and gray iron. Stresses resulting from temperature gradients alone are quite simple to analyze within themselves, but when combined with those which develop from different rates of shrinkage, establish a very complex combination of stresses which are not even constant from one instant to the next from the time the mold is poured until the wheel is shaken out.

The total liquid and solid shrinkage of gray iron is approximately ⅛-inch per foot, whereas the chill has a shrinkage nearly twice as great. Utilizing the normal dimensions of a wheel and the difference in shrinkage of the metal, it is possible to estimate the probable strain which results. With a knowledge of the stress-strain relationship for wheel iron, it is thus possible to predict the internal stress within a car wheel. These estimates clearly indicate that under favorable conditions, the internal stress may be as great as 75 per cent of the ultimate strength of the metal, leaving but 25 per cent to resist external stresses imposed upon it in actual service.

Although much more involved, further stresses are produced by allotropic crystalline transformations as the wheel cools through the critical range of the metal. Since the wheel is not uniform in temperature as it comes from the mold, it is essential to insure complete uniformity of temperature before any part of the wheel enters the critical range. Unless this is the case, one part of the wheel may be actually expanding whereas the remainder of the wheel may be shrinking and damaging internal stresses ensue. Dilatometric measurements have clearly established that internal stresses as high as 50 per cent of the ultimate strength of the material may be produced if one part of the wheel is passing through the critical range either before or after the balance of the wheel enters the critical range.

Other factors being constant, wheels which have been heat treated so as to eliminate all internal stresses will have uniform strength when either subjected to the conventional drop test or the heaviest thermal bands. In addition, the flange strength of the wheel will be uniform and show a higher average strength than if not so treated.

Effects of Internal Stress

Although wheels still possessing internal stresses frequently show good strength, they are invariably erratic and many will be low in strength. When tested with a thermal band of molten metal poured around the entire tread, wheels which have been relieved of internal stresses are immune fom internal cracks or other structural failure due to the high stresses produced by the sharp temperature gradient during this test.

During this investigation, it was learned that very fortunately a heat treating cycle which eliminated all internal stresses was also accompanied by certain structural changes in the metal. This made it possible to examine sections cut from wheels in question and by examination under the microscope determine whether or not the heat treatment had been such as would insure total stress relief. These structural changes serve as a useful index but are not in themselves responsible for the improvement in the physical properties of the metal.

In the as-cast condition, the matrix of the chill consists of distorted lamellar pearlite which after heat treatment is converted to a regular uniform type of structure. Usually the final structure consists of a spheroidized cementite and ferrite. Such a change in structure is clearly shown by the accompanying four microphotographs which were taken of chill at a magnification of 100 and 400 diameters.

Figs. 1 and 2 are typical of metal which has not been relieved of internal casting stresses. The presence of stress is evidenced by the distorted lamellar pearlite in the matrix of the chill. The internal casting stresses did not permit the natural crystallizing forces to establish normal regular lamellar pearlite, but instead the lamellae are distorted. Heat treating experiments in the laboratory clearly revealed that if the same metal was given a stress relief heat treatment, the first change in structure was a straightening of the pearlite lamellae to produce a normal stress free pearlite. Further tests, however, indicated that if the annealing operation was conducted so as to completely spheroidize the matrix of the chill, a further improvement resulted and greater uniformity in strength was obtained.

The structure of the chill in a properly heat treated wheel is

(*Please turn to Page* 69)

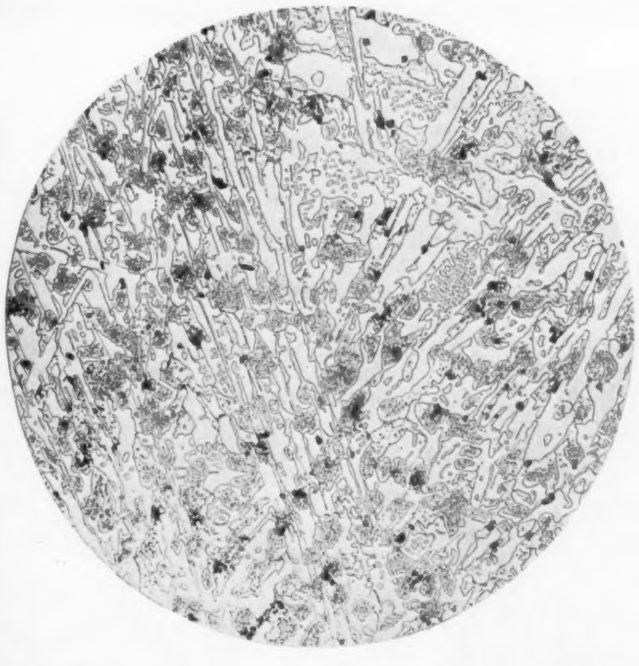
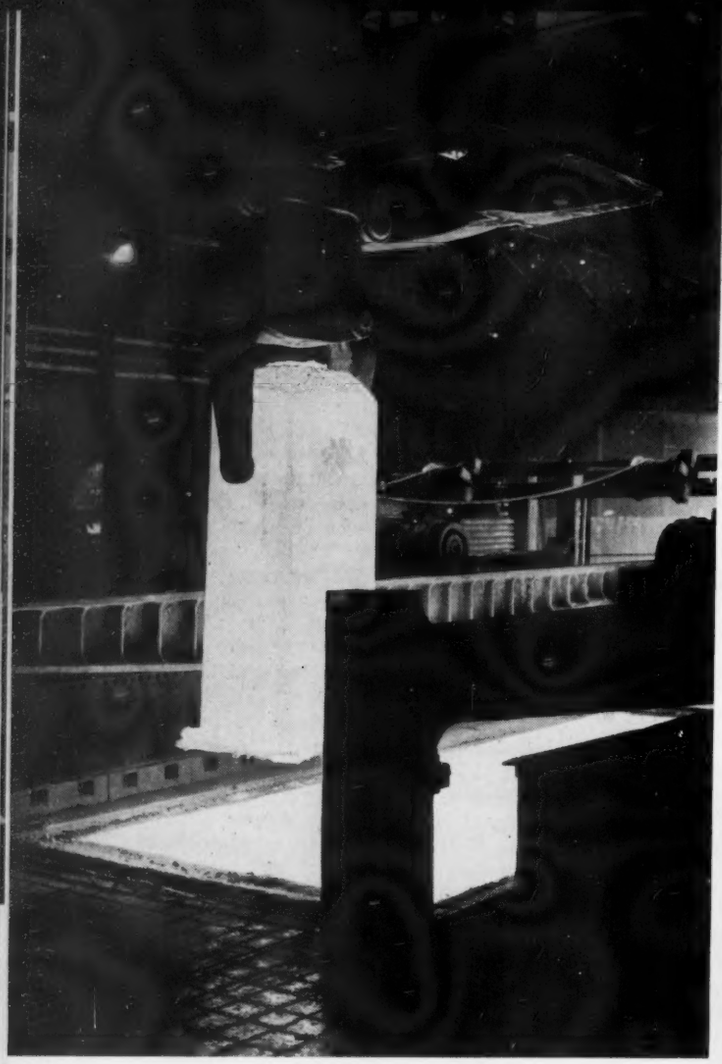
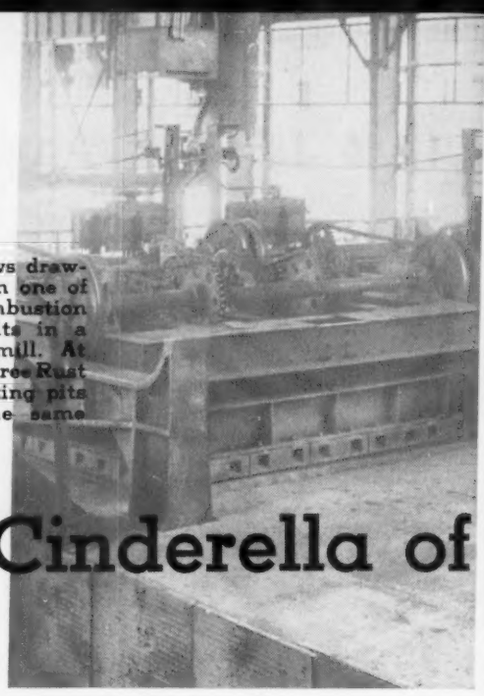


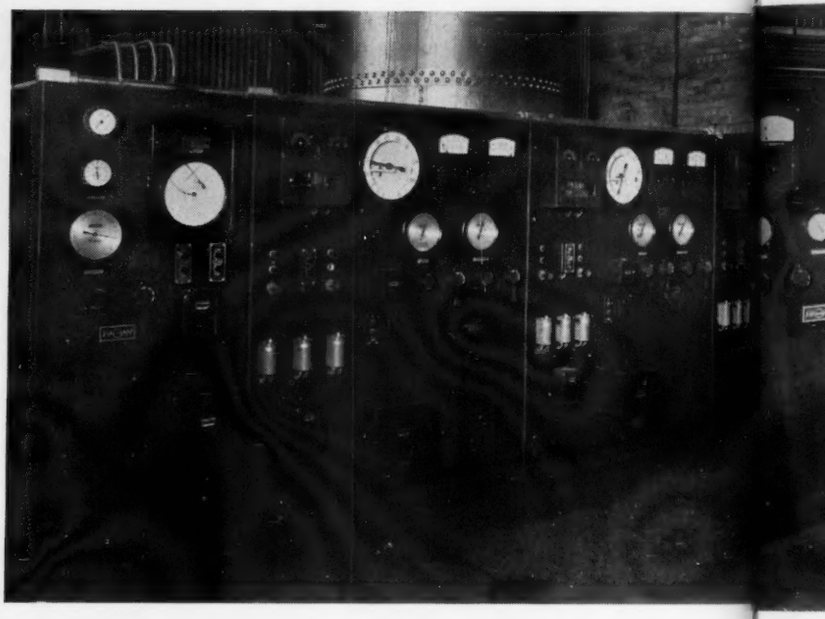
FIG. 3 (left) and Fig. 4 (right) show the structure of the chill in a properly heat treated wheel. Noticeable is the refinement of the chill; also the complete conversion of the matrix to spheroidized cementite

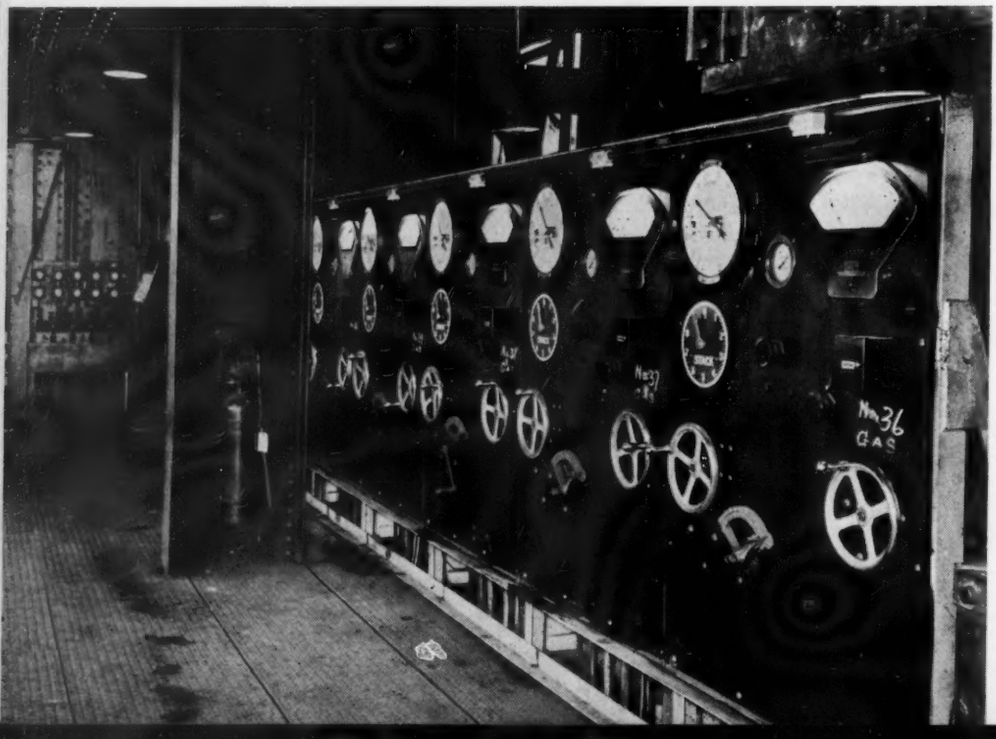


LEFT view shows drawing ingot from one of 15 Surface Combustion Corp. soaking pits in a large Pittsburgh mill. At right are shown three Rust regenerative soaking pits in a mill in the same district

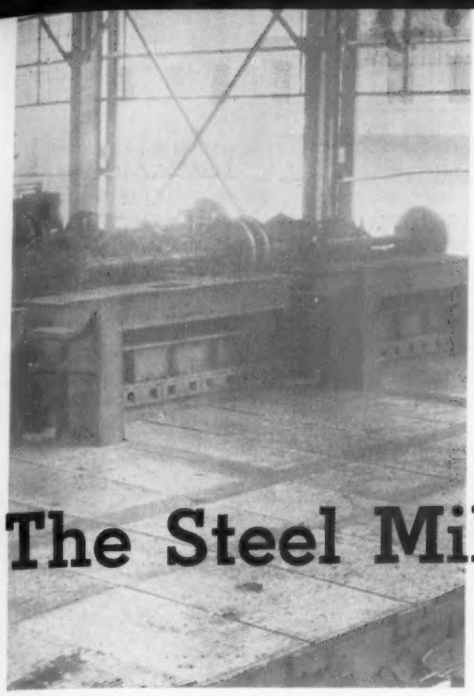


Cinderella of T

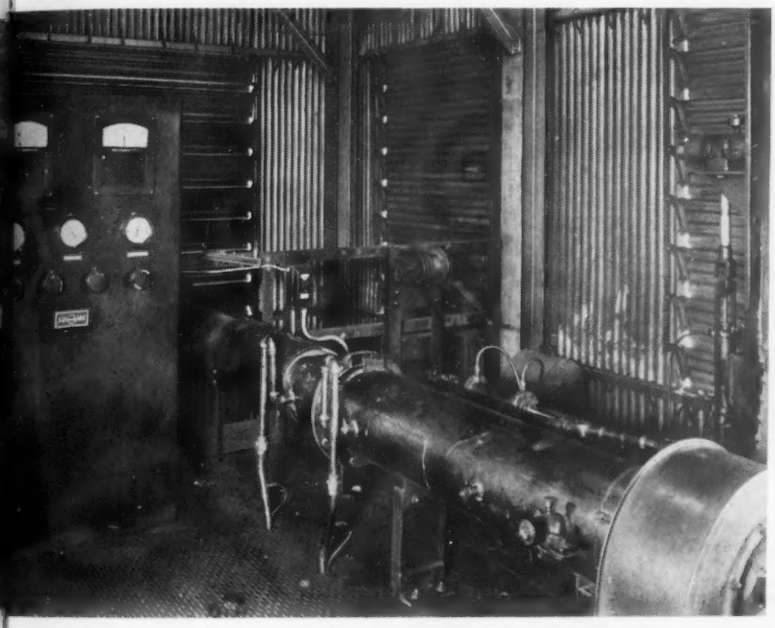




ABOVE is pictured the control panel for the three Rust Furnace Co. regenerative pits shown in the photograph at top center of this page. View at left is the control panel for one of three 5-hole batteries of Surface Combustion Corp. soaking pits



The Steel Mill



ABOVE is pictured a bank of nine Salem circular soaking pits in the Chicago district. Photo at left shows control panel, air-gas ratio regulator and stack damper on Amco soaking pit heating bessemer ingots in a mill near Pittsburgh. Below are shown four Amco soaking pits with automatic control panel, which can be seen in the background at right

IN last week's issue, some of the captions accompanying illustrations for the article "Cinderella of the Steel Mills" were inadvertently transposed. In order that readers may re-examine the seven views of equipment which appeared in Mr. Wagenseil's timely and interesting outline of recent developments in soaking pit design and control, STEEL reruns all of the illustrations, correctly captioned

Creep Testing of Turbine Materials

MODERN steam turbines operate at such high temperatures and pressures that designing engineers must guard against the stretch of steel used in their construction, according to E. L. Robinson, turbine engineering department, General Electric Co., Schenectady, N. Y. Turbine materials are tested for years at a time and changes of one part in a million are recorded and studied, this engineer says.

"Steam power plants in the United States burn about the same amount of coal now that they burned in 1920," says Mr. Robinson, "but they generate twice as much electricity with it. Part of the increase in efficiency has resulted from the use of higher temperature steam, with a resulting higher operating temperature for all parts of the turbine. A modern turbine shell runs, almost literally, red hot.

"A turbine rotor is an immense top, often weighing as much as 20 tons. It spins at whirlwind speed inside a shell which has to withstand pressures such as exist half a mile down in the ocean. But the top spins true and the shell does not leak in spite of the pressure and the heat. Heat softens steel and stretches it, so that care must be exercised to keep the stretch to the merest 'creep.'

"In the Schenectady turbine plant are automatic electric furnaces, held at temperatures which occur in turbines. In them rods of turbine materials, under constant tension, are tested for years at a time. A turbine may change size as time goes on, provided such changes are symmetrical and uniform, but the changes must not exceed about one part in a thousand. The measuring gages on these furnaces easily indicate changes in rod length of one part in a million. We are able to watch, from week to week, the creep of these heated and stressed rods and to determine what stresses may be used without encountering excessive distortion.

"The mechanism of creep is not well understood. In a high-speed machine, an hourly change in length of one part in 100,000,000 is not unreasonable, and our test equipment can detect such movements in a week's time. Yet our scientists tell us that the spacing between atoms of iron measures approximately 1/100,000,000-inch. Perhaps the imposed stress gradually pries an atom loose from its neighbor so it can grasp the next atom beyond. If this divorce and remarriage occur as often as once per hour per inch of length, the material maintains its continuity and strength. But, if they get to happening oftener than once a second, the material is unsuitable to withstand the temperatures and pressures that occur in turbines.

"Creep testing allows us to weed out undesirable materials and incorporate in turbines only steels which will maintain their shapes and dimensions within certain allowable limits during the lifetime of the turbine."

Builds New Roll Grinder

TWO new roll grinders recently developed by Mesta Machine Co., West Homestead, Pa. At left is shown a 60-inch x 24-foot, heavy duty, moving wheel type grinder. At right is a 28-inch moving bed type machine. Both are built with V-belt drive

Reader Comments

(*Concluded from Page* 11)

they are 18 and, generally speaking, the brighter boys wish to go on through college.

For this reason alone industry has better chances of finding the best executive material among college graduates, but it also recognizes that a college education develops the man mentally, socially and broadly, thereby better fitting him for executive work. The practical experience is also necessary; hence the intensive training courses.

I would not say industry has gone so far as to consider college graduates for all good positions to the exclusion of men coming up through the ranks. After all, it is the man and not the education that comes first. On the other hand, we must recognize that it is more difficult for a young man to grow up with a business today than formerly, due to the great technical development of industry.

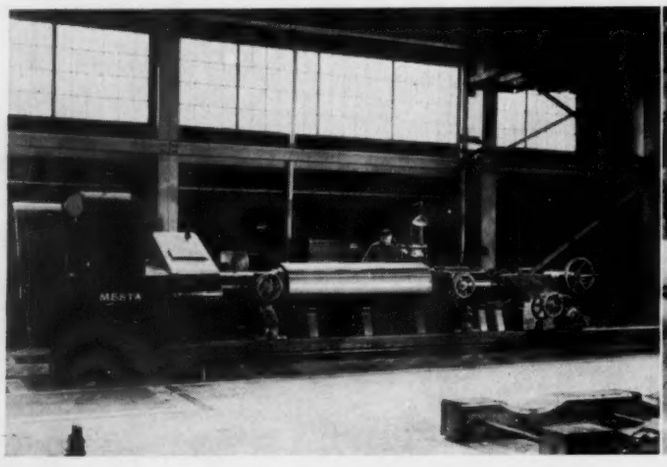
The General Electric Co. is in a relatively new industry, which has as its basis technical knowledge, and consequently we have always employed a large number of college graduates. The number of college graduates has been increasing in all branches of the organization, and consequently more and more of the higher positions have been filled by them.

We have for many years conducted a four-year apprentice training course for those who have graduated from high school. A number of executive positions within the company are now filled by graduates from this course and I would expect in the future this will continue.

In other words, basically, any man who has the intelligence, industry and ambition, if he is given the opportunity to develop and improve himself through training courses provided, may obtain the equivalent of a higher education, and there is nothing in the policy of the General Electric Co., or I believe in industry at large, that will prevent him from going as far as his capabilities will permit.

R. C. MUIR

Vice president,
General Electric Co.,
Schenectady, N. Y.



MATERIALS HANDLING

Repair of Grand Coulee Dam Conveyor Belts Saves Costly Replacements

MOVING a mountain more than a mile and dumping it into Rattlesnake canyon constitutes one part of the extensive conveyorized materials handling program in connection with the construction of Grand Coulee dam across the Columbia river at Grand Coulee, Wash. This part of the work, is regarded as the largest conveyorized construction project in history, and the gigantic conveyor system already has handled between 12,000,000 and 14,000,000 cubic yards of material, with a top of over 50,000 cubic yards in a 21-hour day.

The large conveyor is more than a mile in length, and consists of 22 individually-driven belt sections which run at a high speed of from 600 to 640 feet per minute. Belts are 8 ply, 60 inches wide, surfaced with 3/16-inch of rubber.

The material handled is glacial moraine made up of rocks, stones and damp brown earth, which is

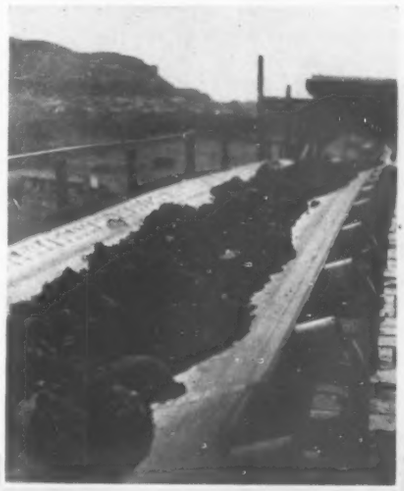


FIG. 2—This close-up of a loaded conveyor belt shows a longitudinal rip along the left-hand edge of the belt, repair of which was effected through use of closely-spaced steel plate fasteners. Photo courtesy Flexible Steel Lacing Co., Chicago

FIG. 1—A general view of the excavation at Grand Coulee dam. Glacial deposit excavated in the foreground is fed by tributary feeder conveyors to the 22-section 60-inch belt disposal conveyor extending over 1 mile up the hill where it is dumped into Rattlesnake canyon. Photo courtesy Jeffrey Mfg. Co., Columbus, O.

MATERIALS HANDLING

dropped on the apron feeders through a grizzly that excludes rocks of more than 16 inches in smallest diameter. The material is elevated 325 feet before it leaves the stacker. Between belts there are drops of from 5 to 9 feet, and to break the full force of the drop, free-swinging hooks are suspended in the way of the bounding rocks.

Carried Mile Up Hill

A general view of the installation, Fig. 1, shows the three conveyor tributary feeders which carry the excavated dirt and rock from the grizzlies where it is dumped to the central feeder for the disposal conveyor. This 60-inch 22-section belt conveyor carries the material over a mile up the hill to the canyon where it is dumped over a 300-foot precipice by a movable stacker.

Each of the 60-inch belt conveyor sections is driven by a 200-horsepower slip-ring motor with overload capacity of 250 horsepower. As shown in Fig. 3, the belts are driven through V-belts and open cut steel gearing. Heavy-duty tapered roller-bearing troughing rolls are used at discharge impact zones or transfer points and standard rolls at other points. Troughing rolls are spaced every 3½ feet; return rolls, 7 feet.

The entire electrical system can be controlled from the operator's cab on the boom of the stacker. All conveyors and feeders in the system are operated as a unit through a simple sequence control with automatic and emergency stop features.

To operate the conveyor system, a start button in the stacker cab is pressed. If all control stations are set for automatic operation, the conveyor motors start up in sequence, each starting after the preceding motor has timed out its steps of resistance. Also, if any motor is stopped, all motors from there to the loading points will trip out, but all motors from there to the dumping point will continue to run.

While the motors on equipment in the pit are interlocked with the main line conveyor system, independent control of these motors is effected at the digging end. The arrangement is such that all trip when the main conveyor trips; or the tributary feeder and tributary conveyor motors trip when the surge feeder motor trips; and each tributary feeder motor trips independently when the corresponding tributary conveyor trips. Telephones at terminal points augment the control.

Because of the severe service resulting from the high speed and the snagging effect of jagged rocks, eight of the belts have been ripped from end to end. Instead of junking these belts, John Cunning, superintendent of the conveyor installation for Mason, Walsh, Atkinson, Kier Co., general contractors for the project, has developed a novel and interesting method of repair. As the belts cost upward of $10 per foot, these repairs have resulted in a tremendous saving in time and money. Fig. 2 shows a belt so repaired.

In making belt repairs originally, two standard steel plate fasteners were joined end to end using three bolts, by overlapping the end of one fastener over the other, and fastening the outer ends in the belts, thereby deriving extra protection to the cross strains of the rip.

Designs New Fastener

To simplify repair, the manufacturer of the fastener has designed a new type of rip plate fastener which is provided with three holes and three sets of bolts and nuts, these to be used instead of the two two-hole type fasteners previously mentioned. This new fastener is shown in Fig. 5. Where the belt travels over pulleys 5 feet in diameter or larger this new fastener may be used both lengthwise and

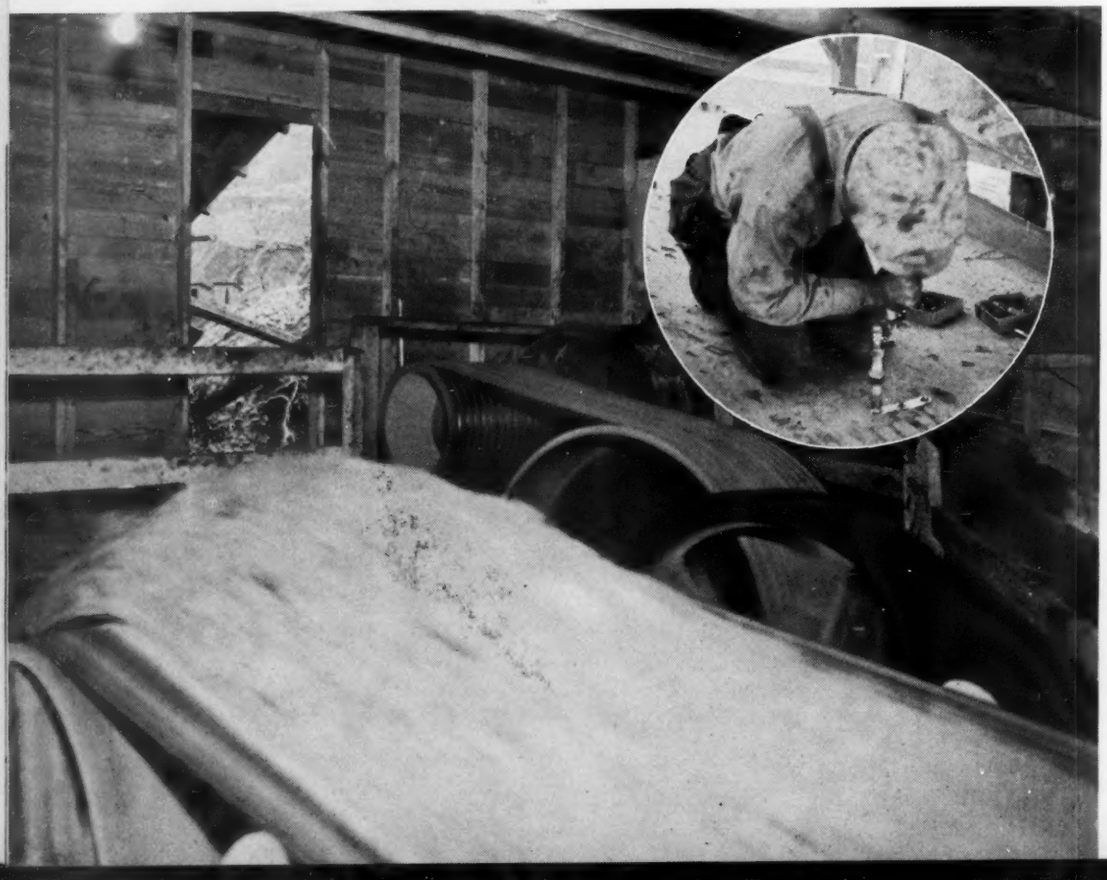


FIG. 3—Each section of belt conveyor is driven by a 200-horsepower slip-ring motor through V-belts and open cut steel gearing. Overload capacity of the motors is 250 horsepower. Fig. 4 (insert)—Between each 7-hour shift workmen inspect all belts and make necessary repairs. Holes are patched, and rips, soft spots and tears, are reinforced with fasteners. The workman shown is using a brace to tighten bolts in a fastener

report looks better than ever . . ."

"Yes, Sir, and J&L Steel helped"

MANY plant executives are finding that this is true—that they get extra advantages, extra savings by using J&L Steel.

You, too, will find that with Jones & Laughlin Steel Products your production costs go down. J&L Steel—applied to your manufacturing processes under the guidance of J&L Metallurgists—gives you faster operation, lower tool costs, fewer rejects.

By concentrating your steel orders with Jones & Laughlin, purchasing is simplified . . . and you save the needless expense of separate negotiations with several different steel sources.

Selling becomes easier because your products have improved quality, greater safety, longer service life—and create customer good-will.

Investigate J&L. Find out why other manufacturers are standardizing on J&L Steel. See your Jones & Laughlin Representative *today.*

In an Emergency

You can get the steel you need—when you need it—from J&L Warehouses and J&L Distributors located in principal industrial centers.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

MAKERS OF HIGH QUALITY IRON AND STEEL PRODUCTS SINCE 1850

J & L PRODUCTS: Hot Rolled Bars, Plates and Shapes · Lightweight Channels · Junior Beams · Bars for Concrete Reinforcement · Railroad Spikes and Tie Plates · Steel Piling · Hot and Cold Rolled Strip and Sheets · Cold Finished Bars and Shapes · Wire Rods and Wire Products · Seamless & Welded Tubular Products · Tin Plate, Black Sheets and Manufacturing Ternes · Fabricated Structural Work · Coke By-Products

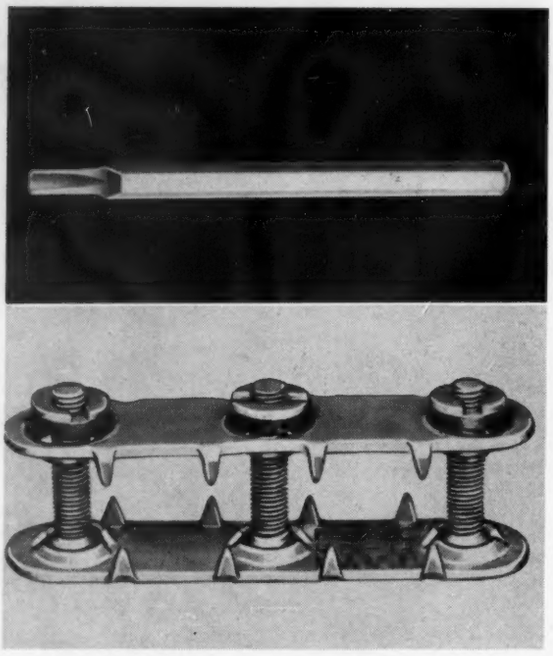


FIG. 5—The new type of steel plate rip fastener (bottom) used to make repairs in conveyor belts has three holes through which the holding bolts pass. A special type "button hook" (top) is utilized to catch the bolts and force them up so that the nuts can be started

crosswise of the belt, but on smaller pulleys it is advisable to use it only crosswise on longitudinal rips.

Where rocks have beaten holes in the belts or made "soft" spots, the practice is to patch with new belting rather than to put in new sections. The patches must be rectangular or L-shaped, and must run parallel with the edges of the belt. Diagonal patches do not stand up under the cross tension. Corners of the holes should be rounded, so a plate can be set in. On the sides of the patches parallel to the edges of the belt, the fasteners are spaced about 3 inches apart, but on the ends that bear the pull, they are set close together.

Use of these fasteners has saved thousands of feet of belting. Any of the workmen can apply them rapidly after a single demonstration, and all are equipped to do so in case of an emergency shutdown.

Much Time Is Saved

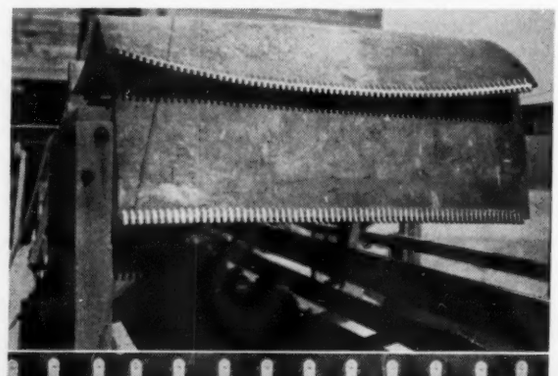
The time element is of great importance with from 1200 to 2500 cubic yards of material per hour going off the end of the stacker at a specified contract price per yard. Use of fasteners makes for shorter stops than when belt tension is released, new sections measured, installed and tension renewed.

The conveyor operates on three 7-hour shifts. When the belts stop between shifts, the operators go over the belts armed with carpenter's claw hammers, to pound or test out soft spots, and fasteners with necessary tools to apply them. Holes are patched and rips, soft spots and tears reinforced with the fasteners. The workman shown in Fig. 4 has applied a fastener and is tightening the nuts on the bolts. To speed up fitting the lower bolt into the top plate Mr. Cunning developed a special "button hook," as shown in Fig. 5. This is inserted in the bolt hole, catches the end of the bolt and forces it up so that the nut may be started. Bolts are tightened by a special brace and the projecting end broken off.

All of the belts, except that used on a telescopic section feeding the stacker, which must be extended and lengthened as the canyon fills and the stacker moved forward, are connected by plate fasteners. The telescopic section belt has 17 joints of steel hinge-and-pin type lacing, as shown in Fig. 6. In extending this section 100-foot sections of belt already prepared with metallic fasteners at each end are kept in readiness. When tension is released the hinge pin is pulled from the joint, the stacker is moved forward, the insert is connected up and work goes on. A new section may be installed in 28 minutes.

Method Is Economical

In this installation thousands of fasteners are used for patching belts instead of replacing the torn sections or holes, with a considerable saving in time and belt replacement. Various arrangements of fasteners in making belt repairs are illustrated in Fig. 7. Ordinarily a belt torn from end to end would be considered as a total loss, however, repairs made in the manner described permit continued use thus saving several thousand dollars on each of the eight ripped belts. Ordinary patches are made more quickly than a belt could be removed and a section replaced.



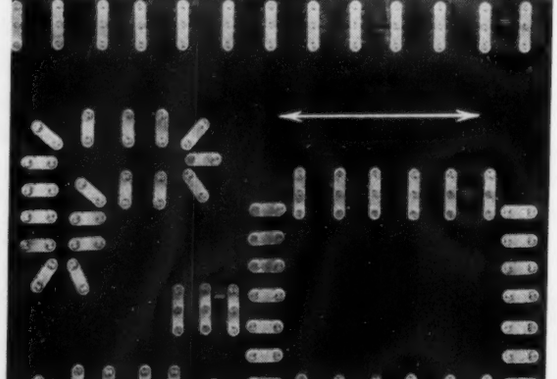


FIG. 6 (top)—Flexible steel belt lacing used on belts on telescopic section of the conveyor which is extended as the spoil fills the canyon. This lacing is of the hinge-and-pin type. Fig. 7 (bottom) — This sample belt shows various arrangements of standard and special plate fasteners as they are used in making repairs

• • •

New Method of Binding Scrap Proves Profitable

HOW neat handling of waste adds a profit is narrated in the Spring issue of *The Signode Seal,*

(*Please turn to Page* 75)

WELDING, ETC.

BY ROBERT E. KINKEAD

Need New Rolled Sections for Welding

THERE is a general belief among welding men that if the rolling mills would produce some new sections particularly designed for welding the result would be a large reduction in cost of welding and a considerable increase in use of welding.

Pressed for particulars, it usually develops that existing sections can be used to accomplish the purpose about as well as a new section.

The fact that it has not been necessary up to the present time to develop and roll special sections for welding applications is impressive, particularly in view of the fact that the mills would have developed such sections and tied them up in baby ribbon for their customers four years ago if it would have sold any more steel.

The plain fact is that 99 per cent of the structures needed can be welded of plate, pipe, beams, channels, angles and tees.

It is conceivable, although far from proven, that wide flange beams could be made as cheaply by welding as they are now rolled, taking into consideration the widely varying demand for the product over a ten year period. For welding, the top and bottom flanges would be rolled with about 1½ inches of the web on the flange and the end of this short web would have a rudimentary kerf preparation rolled on it.

The web would then be cut from plate of the desired thickness and width and the two flanges butt welded to the web. Such practice would certainly lead to sections more nearly correct from the mathematical point of view than the present day wide flange beams. But the weight saving attained by such correctness could hardly be reduced to impressive dollar savings. Ordinary carbon steel is one of the lowest cost materials ever used to carry stresses.

The mills will roll any kind of a section anyone wants badly enough to pay for the necessary rolls. Since the rolls will become the property of the customer and subject to his control, anyone who can design a new section that will show great economies in welding has an opportunity to go into the business and supply the country with the section at a profit.

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

• • •

For and Against Concave Fillet Welds

THERE is probably ten times as much weld metal used to make fillet welds as in end to end butt welds, and it is therefore important that the best use or disposition of the metal in fillets be made.

The case for concavity amounting to about ⅛-inch per inch in the chord measured across the hypotenuse of the fillet may be stated as follows: lower degree of stress concentration, probability of better root penetration, better appearance from the mechanical point of view.

Against concave fillets the case is built on the necessity for positioning the weld. The particular make of welding rod is not a factor since concave fillets may be made with any commercial welding rod.

Straight-faced or convex fillets made by welding without positioning have a labor cost 40% to 60% higher than if the job is positioned so that heavy currents may be used—assuming, of course, that the metal being welded is ⅜-inch thick or thicker.

It is rapidly becoming out of style in the economic sense to do welding in the vertical or overhead position if it can be put on a positioning device. The most superficial investigation of stress distribution in fillet welds, subjected to loading transverse to the long dimension of the fillet, will show their undesirability even if they cost less, instead of more, to make. The convex part of the fillet costs extra money to apply, with the net result of reducing the ability of the weld to stand repeated application of transverse loading.

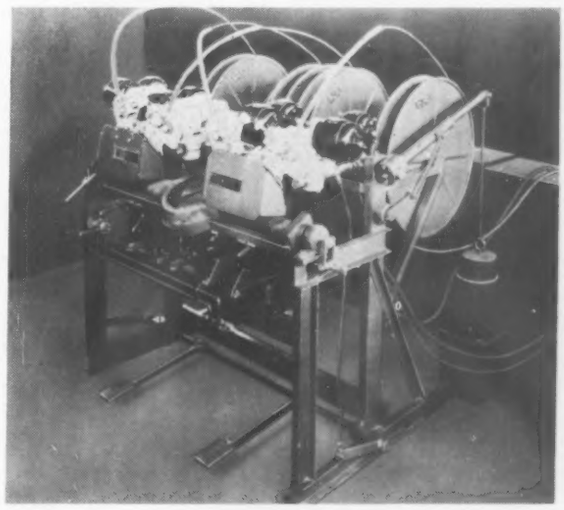
The welding shop would accomplish the same result by throwing 25% of the welding rod it buys into the scrap pile and skimping the dimensions on the welds made with the remainder.

New Edition Covers Operation of Lathe

South Bend Lathe Works, South Bend, Ind., has recently announced the publication of the 33rd edition of its machinists' manual entitled "How to Run a Lathe." The new edition has 160 pages containing most recent and authoritative information about the fundamental operations of modern lathe practice. Instructions on every phase of lathe work are given in detail in easily-understandable language and accompanied by more than 300 illustrations.

One Operator Makes Four Welds

PRODUCT of Una Welding Inc., Cleveland, this machine has a work holding fixture for welding two U-shaped shock absorber clips on a banj-type axle housing. Four 2-inch welds are made by the four arc welding heads placed as shown. Capacity is 240 clips per hour



SURFACE TREATMENT AND FINISHING OF METALS

Co-operative Effort Solves Finishing Problems of Automotive Industry

FEW if any industries have a closer association with the various processes of finishing metals than does the automotive industry. Finishing methods subdivide themselves into three main classifications —plating, painting and enameling, and rustproofing. With each the automobile industry is concerned vitally, and from three standpoints —appearance, durability and cost.

Plating problems encountered by an organization as large and varied as the General Motors Corp. are numerous, and a carefully defined plan of action to solve them has been evolved. Plating superintendents from 28 of the corporation's subsidiary manufacturing divisions, 19 of whom are university graduates, incidentally, meet in Detroit at regular intervals, lay their problems on the table and attempt to work out solutions. W. M. Phillips, an engineer of finishes for the corporation, acts as chairman of this committee. At the same time they examine carefully new ideas in plating practice and equipment, to keep abreast of developments.

Exposure Tests Conducted

A similar committee meets regularly to consider problems arising in painting and enameling departments throughout the corporation's plants. Backing up the work of these two committees are the tests conducted by the research division in Detroit, and reports on exposure tests from Coral Gables, Fla., where the corporation ten years ago purchased 5 acres of land for the purpose of determining weathering characteristics of panels representing all types of finishes. The location was selected because it represents probably the most severe exposure conditions for automotive finishes.

The corporation also works closely with committees of such organizations as the American Society for Testing Materials, and the Electroplaters society, in their problems to develop specifications for finishes.

According to Mr. Phillips' figures, 1932 was the year in which the maximum amount of plate was used, whereas, oddly enough, 1933 showed a minimum use of plate. Since 1933 the amount of plated parts on the cars has been gradually increasing.

Bulk of Plating Is Chromium

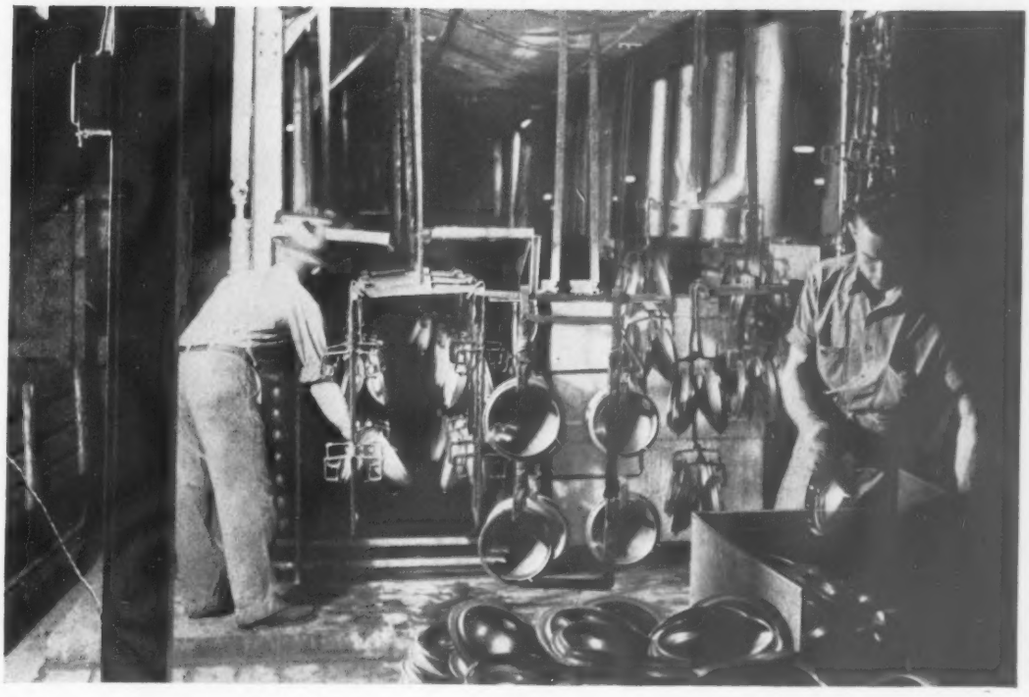
Naturally, the bulk of the plating work for automobiles is chromium plating. Chromium plating, contrary to popular conception, is a very thin coat of chromium over a heavy coat of copper-nickel, where steel or die castings are used in fabricating the part to be plated. Cadmium plating has come in for use on certain exposed parts, but lately has been giving way to bright zinc plating, and a combination of rustproofing and lacquering or waxing. The latter treatments are confined generally to such parts as bolts, nuts, washers, brackets and the like underneath the car. Reason for the switch from cadmium has been the soaring price of the latter metal and the perfection of suitable bright zinc plating processes.

Improvements in plating practice during the past ten years have at least tripled the life of chrome plates, in the estimation of Mr. Phillips. Such improvements largely have been concerned with the thickness of base metal plates rather than an increase in the thickness of the chromium itself, which if too thick will tend to crack the layer of nickel beneath it due to liberation of hydrogen in the plating process.

General Motors specifications now call for at least 0.001-inch of copper and nickel beneath a chromium plate, both for steel and for die castings. This base plate must comprise at least 0.0005-inch of nickel and may be entirely nickel, although for die castings it is preferred to have some copper plate, because it improves corrosion-resisting properties. As platers know, it costs no more to make the base plate entirely nickel, than to make it a combination of nickel and copper.

Bright Nickel Affords Economy

A recent development which General Motors divisions have used to advantage is the bright nickel plating process, by which it is possible to eliminate all buffing formerly required between the base plate of nickel and the final chrome plate on a part. For example, on hub caps, it is possible to clean, copper plate, nickel plate and chrome plate continuously and automatically, without ever removing the part from the rack on the conveyor. This represents a considerable saving over former methods where intermedi-



THIS continuous automatic plating machine in the Guide Lamp plant of General Motors Corp., Anderson, Ind., deposits copper, nickel and chromium on brass hub cap shells in one continuous operation

ate buffing was deemed necessary.

Hub caps, incidentally, are now made in a combination design, with an inner pressed steel cap, electroplated with zinc, over which a chrome plated and embossed brass outer cap is pressed tightly. By this means added protection is given to the chrome finish, since if it is scratched or cracked by stones, the brass will not corrode and force the chrome plate off the surface as happens when a steel outer cap is used. The steel inner cap provides the necessary strength, and the zinc plating over it prevents any bleeding of rust on the steel from damaging the plated brass shell. The latter is thin-gage material and fits tightly over the steel backing. All General Motors divisions now use this type of hub cap, a design which has been facilitated by the trend to large diameter dished caps without any reverse curves in their section.

Bumper Finish Presents Problem

Of all the plated parts on a car, bumpers bear the brunt of attacks by corrosive agents, impacts and other deteriorating influences. Collisions with other vehicles, a steady blasting from stones and gravel, together with the ravages of strong salt solutions used on highways in the winter to melt ice, put the finish on bumper steel to a real test.

One of the best means for protecting the plate on bumpers and other plated parts has been found to be the occasional oiling or waxing of the surface. Engineers recommend this be done about three times during the winter to protect the chromium against the corrosive action of salt.

One obvious means to circumvent corrosion and peeling of the chrome plate on bumpers is to make the part of stainless steel instead of the conventional spring steel. High cost of stainless reacts against such construction, however. Use of stainless-clad steel has been proposed and tests on bumpers of this material have been made, showing it to be ideal for use, but the added cost of the material as yet cannot be justified by car manufacturers.

As mentioned previously, the mounting cost of cadmium has forced the abandonment of cadmium plating to a large extent, with bright zinc plating and a combination of rustproofing and lacquering being substituted. It has been found that bolts which are rustproofed and then given a coating of nitrocellulose lacquer are about comparable in corrosion-resisting qualities to those given a bright zinc plate. Some parts are rustproofed and then given a coating of a special wax, but the latter does not give the protection afforded by the lacquer.

Although no radical revisions have been made in painting and enameling procedure for automobiles in the past ten years, there has been steady improvement in the permanence and uniformity of body finishes. In general, the process for finishing bodies involves thorough cleaning of the sheet steel, application of an iron oxide surfacer by spray, spot glazing with a putty compound, wet sanding of the surfacer, and application of the finish coats of nitrocellulose lacquer or synthetic enamel. The latter is applied by spray, with from four to eight coats being the usual practice. Before the final coat is applied the finish is dried thoroughly. Thickness of the lacquer is held within 0.001-0.003-inch, paint gages being used to test the thickness. The final operation is polishing with sheepskin wheels.

One of the new developments in body finishes is the introduction of a metallic tinge to colors other than black. This is accomplished by adding an exceptionally fine aluminum powder into the pigment, the fineness insuring perfect mixing and a uniform distribution throughout the enamel. Close inspection of many of the finishes on newer models will reveal the presence of this metallic element which adds considerably to the "snap" of the color.

It is really an outgrowth of the former pearlescent finishes which contained a pigment made from herring scales. However, difficulties encountered in obtaining uniformity of appearance and distribution of this element, resulting from the difference in specific gravity between it and the other pigment, led to its abandonment. Aluminum provides the metallic appearance desired, with somewhat less prominence and much greater durability than the "herring scale" finishes.

Finish Durability Increased

There has been a great improvement in the durability and effectiveness of pigments used. The dark blues are much more permanent, as are the reds and maroons. Many of these pigments are of metallic origin. Black, of course, is the most permanent color now available for automotive finishes because of low light penetration, one reason why it outranks all other colors in the public's favor. However, in 1937 models, at least two other colors

(*Please turn to Page* 76)

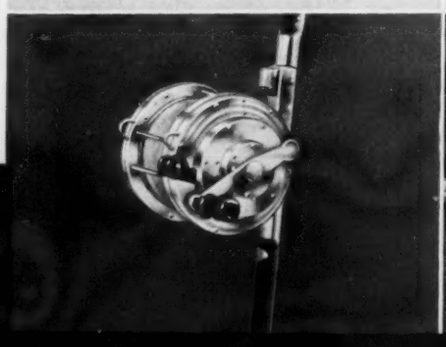
The *closest approach* to

KEEPING YOUNG . . . with U·S·S Stainless Steel. An attractive room in a San Francisco Club, paneled in redwood and accented with strips of dazzling U·S·S 18-8. Architects and interior decorators use stainless to keep their work from growing old, because stainless is the only "white metal" which can permanently maintain a silvery surface. It resists time itself.

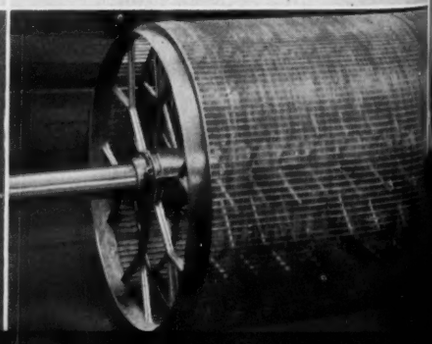
IT RESISTS HEAT. This still connection for high temperature service is so designed that the vapors will touch nothing but U·S·S Stainless Steel. At temperatures disastrous to other metals, stainless is still strong and corrosion-resistant.

IT RESISTS WEATHERING . . . and that's why NATIONAL Tubing of U·S·S Stainless Steel was used for all bright metal work on this coin telescope on the Empire State Building a thousand feet above Fifth Avenue. It defies smoke and fog and salt air and rain.

IT RESISTS SALT SPRAY . . . and so Zane Gray's game fishing reels are machined from free machining U·S·S Stainless Steels by Arthur Kovalozsky in Hollywood. Stainless steel keeps the parts corrosion-free, ready for instant action when big fish strike.



IT RESISTS CORROSION. This cylinder mould goes in a sulphite mill where it will wash and separate the pulp from corrosive liquor. U·S·S Stainless Steel bars and wire were specified to avoid corrosion and eliminate any possibility of rust spots from this source in the finished pulp.



to the PERFECT METAL!

U·S·S Stainless Steel resists every destructive force of nature

THE more you learn about stainless steel, the more you realize its importance.

Its name has now become almost a misnomer.

For this brilliant metal is far more than merely "stainless". True, it is immune to all food and beverage corrosion and is more resistant to more corrosive agents than any other commercial metal.

But stainless steel also resists heat. It resists abrasion. It resists high stresses. It resists fatigue and sudden shock. It resists fracture. It reduces friction. It resists weathering. It resists mechanical deformation.

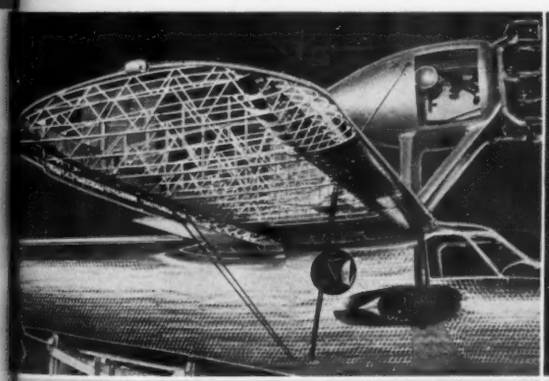
In fact, stainless steel seems almost to resist time itself . . . to resist, to an amazing degree, every destructive force of nature.

Because it is so permanent, it is not too much to say that stainless steel is ***metallurgy's closest approach to the perfect metal.***

Today, nearly every industry is taking advantage of this clean and brilliant metal—and those that aren't soon will be.

Stop and consider, in your own business, where stainless steel might be able to lengthen the life of expensive equipment . . . to eliminate contamination . . . to permit the use of more efficient operating conditions under temperatures and pressures disastrous to other metals . . . to reduce the time and cost of equipment cleaning . . . to increase purity and sanitation . . . to turn out a richer looking product . . . to attract attention, attract customers and add a new selling feature.

Write us freely about any use you are considering for stainless steel. Our metallurgists, specialists in solving new and unusual problems with stainless, will be glad to study your problem and to submit sound, practical recommendations.



T RESISTS HIGH MECHANICAL STRESSES . . . in ct, stainless steel construction offers a higher strength-eight ratio than any other metal, so it is being used now build lighter and stronger aircraft. In addition, stainless eel can be easily fabricated by welding.

IT RESISTS ABRASION. In these connections for a sand-blasting machine U·S·S Stainless Steel gives cheaper service because of its high resistance to abrasive wear. Notice the neat welds.

IT RESISTS BITING ACIDS. Here's something new—*nitric* acid in steel barrels. U·S·S Stainless drums deliver the acid commercially iron-free and eliminate crates, crate repairs, breakage, fire hazard, and freight charges on heavy carboys.

U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
NATIONAL TUBE COMPANY, *Pittsburgh*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

PROGRESS IN STEELMAKING

Condensation Cleaning of Blast Furnace Gas

BY ROBERT R. HARMON, Chemical Engineer, Peabody Engineering Corp., New York

IT IS a rather curious commentary on what, in legal parlance, may be called the "state of the art" as applied to the cleaning of blast furnace gas that no one has until recently given any consideration whatever to the utilization of what is perhaps the most essential constituent of the gas, namely, its water vapor content or degree of humidity.

Here, ready at hand or easily obtainable, is an element in the gas itself which if properly appreciated may be made an important, if not the most important, element in a process for gas cleaning which may be carried to the point of making the gas available not only as a fuel for boilers and regenerator stoves but for gas engines as well.

The presence of water vapor in the raw gases, its lowering effect on flame temperatures, coupled with the failure of all dry cleaning systems to adequately purify the gases, has created a widespread adoption of wet cleaning methods, either mechanical or electrical.

Some years ago serious attempts were made to dry completely the blast to the furnace, yet today it is a fact that if the raw gases were actually free of condensable moisture, cleaning efficiencies and costs would not be at all commensurable with what they are and it would be necessary to add water vapor to the gases to clean them successfully.

Since adequate cooling is recognized now to be a prerequisite to the best cleaning and combustion efficiencies, a discussion of the condensation method of purification will undoubtedly be received with greater favor and its merits more clearly appreciated than heretofore.

Irrespective of the means employed, it is axiomatic that coarse particles of suspended matter are more easily removed from the gases than the fine ones, and whereas the coarse particles may constitute the bulk in weight of suspended matter, yet the fine particles are more numerous. This, of course, is what makes ultimate cleaning so much more difficult than primary cleaning.

Theory of Cleaning

Because of the microscopic nature of the fine particles, it is the common objective of all cleaning systems to increase the mass of the individual particles of dust or fume, by driving them into a film or drop of water, or loading them with electrons, or, as in the present case, the condensation method, causing water vapor to condense upon them.

This method of purification is based on physical facts too well established to be challenged. That is, under normal pressure conditions water vapor condenses only in the presence of nuclei or free surfaces, which means suspended matter. Condensation is a surface phenomenon and the more particles of suspended matter present, the more droplets of water will be produced in condensing the vapor. The larger particles of matter present, because of their more extensive surface, receive and hold more condensed vapor individually than the smaller ones.

Atmospheric "dust counts" are universally made by meteorologists with the socalled jet condenser. With this instrument water vapor is caused to condense on the suspended particles in a sample of air to form drops which are trapped from the jet of air because of increased weight due to the film of water they have accumulated. This is the one known method of catching every particle and retaining it in its initial state.

Now, in every case where blast furnace gas is cooled below its dew point, water vapor is condensed and dust particles are wet thereby, as in the illustration just cited, and consequently a certain measure of useful work is done. It is reasonable to suppose that because water vapor has always been condensed in every cooling operation, its potentiality as a medium of purification has been overlooked or minimized in the search for other

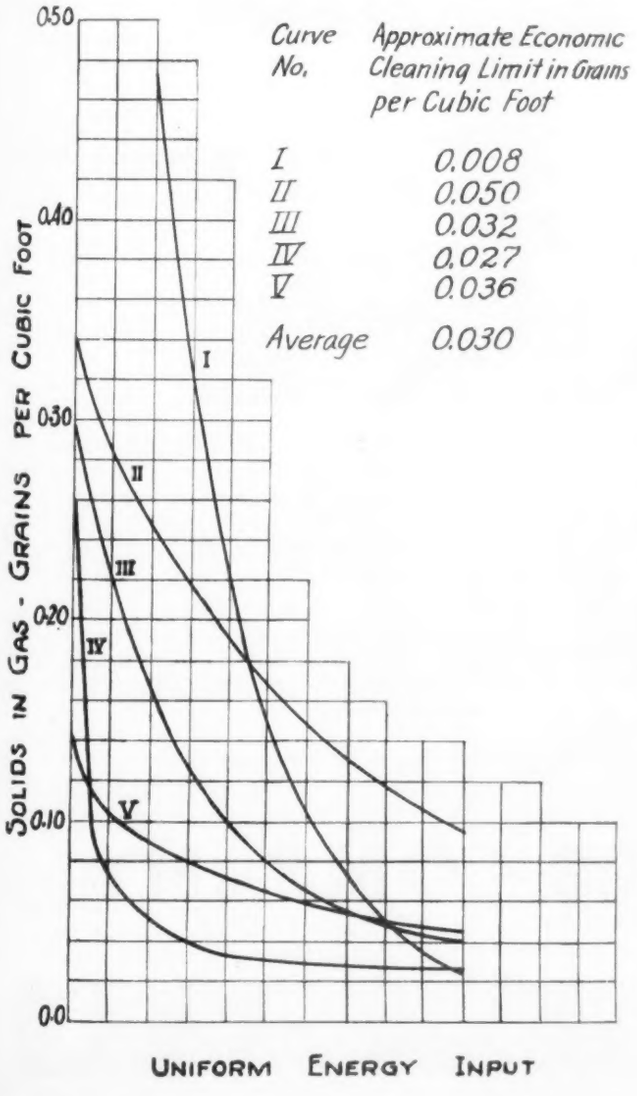
means. As a result, even the most up-to-date systems consider vapor in the gas and its condensation as a means to an end rather than as a means in itself capable of producing the desired result. In fact, cooling and condensation are carried out in complete disregard of inherent values, and condensation is considered merely as an adjunct to more elaborate schemes for gas purification.

In condensation cleaning three factors are of vital importance. First, the suspended dust and fume in the cases; second, water vapor in the raw gases; third, the sensible heat of the raw gases. All of these three items are susceptible of the widest possible variation and since the removal of the fines is dependent upon the initial water vapor carried by the gas, plus that which is available from transformation of the sensible heat into latent heat, it should be fairly obvious that mere cooling as commonly practiced can yield but one indifferent result. That is, a gas only partially cleaned as delivered from the average tower washer.

The commonsense need for preserving the full store of vapor for condensing on the finest particles only should be plainly evident when it is realized that a large percentage of dust and fume can be wet by other methods than the condensation of vapor on the particles, and thus be readily removed from the gas stream. The larger particles may be taken out of the gas stream by proper primary washing by means of water jets, without the loss of water vapor from the gas. The humidity of the gas thus partially cleaned remains available for further cleaning by the condensation process. But, up to now, no system has ever provided means for preserving this vapor for the most difficult work, the final cleaning operation.

Sensible heat in the gases, as such, has no merit or value in the mechanics of dust removal. On the other hand, if considered in terms of being a source of water vapor it becomes a source of energy and is extremely meritorious and valuable. Strange as it may seem, as cooling of the gases is normally carried out, very little of the sensible heat is transformed into latent heat because it is dissipated by direct absorption in the cooling water.

The previous statement that condensation of water vapor is a surface phenomenon and that the number of drops formed is determined by the number of suspended particles present, has a direct bearing on what has until recently been considered good practice. This practice is to deluge the hot raw gases with sufficient water to cool them. This procedure immediately dissipates the sensible heat and condenses the water vapor in the presence of a great bulk of dust and fume and on large and small size particles alike. Thus condensation occurs on the vast surface presented by the area of this bulk of matter and constitutes a sheer waste of potential energy, not recoverable. The result is that fine cleaning must then be undertaken as a separate and distinct enterprise.



Curve No.	Approximate Economic Cleaning Limit in Grains per Cubic Foot
I	0.008
II	0.050
III	0.032
IV	0.027
V	0.036
Average	0.030

CURVES for various blast furnace gases showing their different response to a uniform mode of treatment for solids removal. The accompanying figures show the approximate economical low limit of cleaning which may be expected in each case

Cleaning Procedure

Ample experimental and development work undertaken by the author has substantiated the truth of these statements and the logical outcome of this work has dictated the following procedure, embodied in the new condensation method:

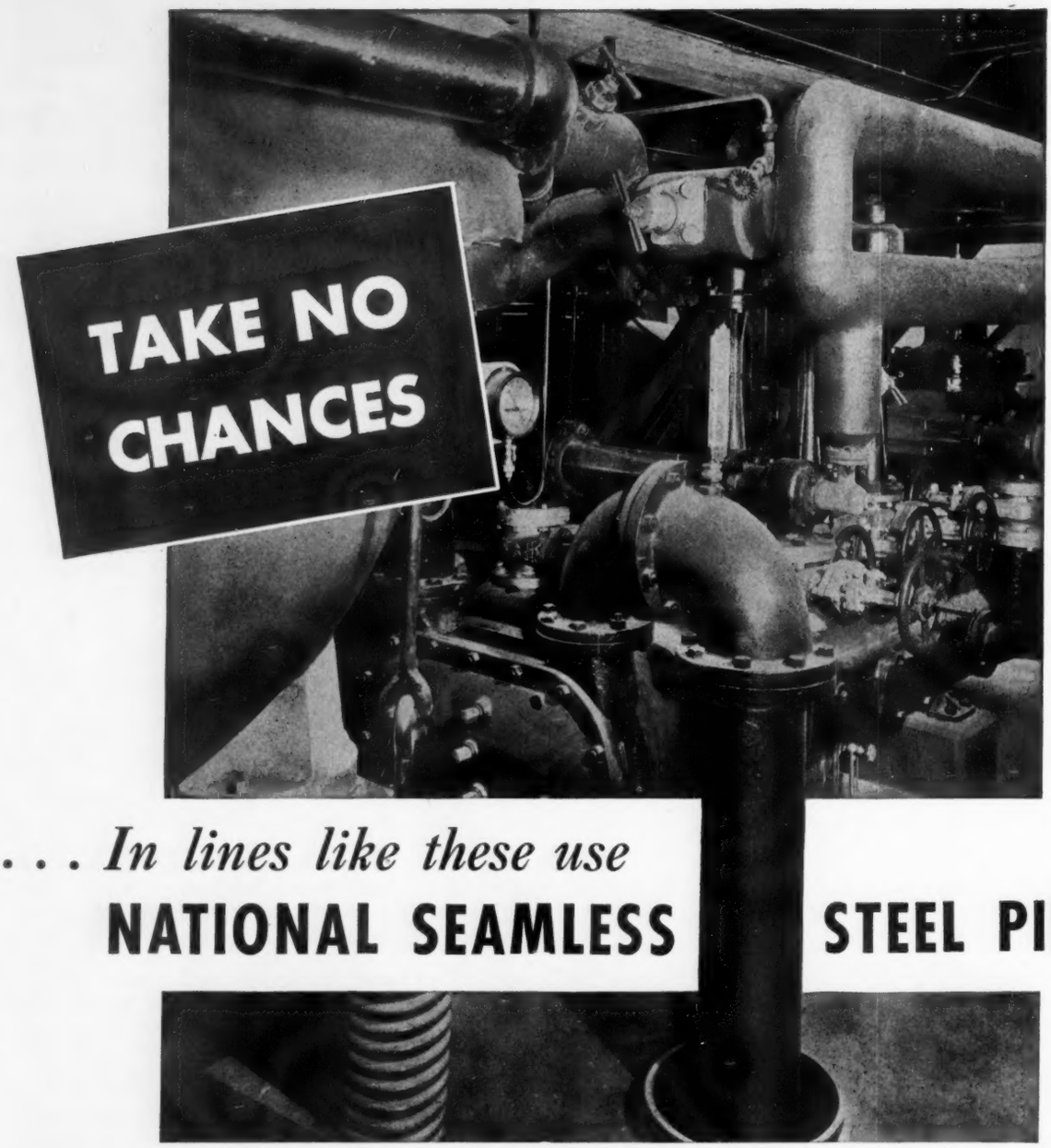
1—Intensively scrub the gases to remove all solids yielding to mechanical treatment, while the gases are at a temperature above their final dew point;

2—Simultaneously with the scrubbing operation, transform all sensible heat of the gases into latent heat by evaporation of the maximum amount of water. This is accomplished and safeguarded by recirculation of hot water through the primary scrubber, permitting ample time for complete humidification and preventing any condensation of water vapor during these two operations;

3—Regulate humidity to maintain a uniform dew point of the gases;

4—Cool the stripped and humidified gases step by step to condense the water vapor on the residual fine particles, removing the larger particles in each cooling step to prevent subsequent condensation of vapor on them;

5—Regulate the degree of cooling in each condensation stage, or, in other words, control the distribution of condensed water vapor in the cooling stages so as to cause the wetting and immediate removal of the larger particles of dust in each stage. Thus as the gas passes from stage to stage it becomes cleaner and cleaner, the only limit being set by the amount of water vapor remaining in the gas. These latter steps may or may not be necessary and the answer to this question is governed by the par-



. . . *In lines like these use*
NATIONAL SEAMLESS STEEL PIPE

HIGH pressures and high temperatures demand safe, dependable pipe. For these conditions nothing equals NATIONAL SEAMLESS. Why? Because it's pierced from solid steel! Nothing better could be said about any pipe. For "seamless" means pipe made without welds — with no long line of possible weakness. It means maximum security and maximum value — the one pipe that offers the unique combination of utmost reliability, long life and economy.

The process by which seamless pipe is made is in itself a test of the quality of the material. You can't pierce steel successfully unless it is of highest quality, homogeneous, without flaws. And the pipe, being seamless, removes all uncertainty regarding uniform wall strength. That is why all the rigors of modern service conditions — excessive contraction and expansion — vibration — elastic distention due to pressure — and other hazardous conditions imposed on power pipe are handled with safety by NATIONAL Seamless.

This superior pipe is remarkably workable too. You can make bends, turns, and coils. You can flange it without injury. It is readily adaptable to any type of joint, and, being seamless, you have that much additional strength and safety in the joint. Long lengths, full range of sizes up to 24 inches, and various wall thicknesses are available. It is clean and smooth for insulating coverings.

So we say, when you want all-round safety and efficiency — take no chances, specify NATIONAL Seamless — it means maximum security.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

ticular cleaning operation dealt with.

This conception of the proper method of treating blast furnace gases to make their heat content available for the performance of useful work has passed beyond the theoretical and experimental stage and has culminated in commercial installations rendering new and distinctive service.

Gases from blast furnaces are normally reported as containing on the average 35 grains of water vapor per cubic foot at 60 degrees Fahr. and 30 inches barometer. For purposes of heat calculations this figure is acceptable, but, as a matter of fact, the water vapor content at any one time may be considerably at variance with this value. As a rule the gas temperature is highest when the water vapor content is lowest and vice versa. Without some means of ironing out these peak conditions a considerable variation would result in the quality of the cleaned gas. This condition is most readily stabilized and the water vapor content maintained at a fairly uniform value by means of the recirculation of hot water through the primary stages as previously described.

Results Obtained

Results attained in the operation of this system of cleaning on a reduced scale have been previously reported but they are given again for the benefit of new readers, and because subsequent applications to industrial gases have proven its fundamental merit.

A 2-stage system embracing a humidifier or primary unit and a condenser or secondary unit with necessary pumps and settling tank was operated continuously for a period of weeks to treat gas from a furnace making basic iron. The gas from the dry dust catcher, carrying from 1.5 to 3.0 grains of very fine dust per cubic foot, entered the humidifier and the cleaned and cooled gas from the condenser was conveyed to the stoves. With the condensation of varying amounts of water vapor the gas was cleaned over a range of 0.004 to 0.030-grain per cubic foot, and at all times the gas leaving the secondary unit was perfectly dry. Aside from accurate determinations of total solids content of the cleaned gas, a simple test for gas quality was to permit the gas to blow through a small rubber hose and to ignite it with a match as it discharged into the atmosphere. It is always readily ignited and burned without difficulty.

Notwithstanding all that has been written on the subject of cleaning blast furnace gases, very little discussion appears regarding the method and apparatus employed in making dust determinations. Accurate analysis for dust content is by no means as simple as one might think. In the course of many years work in this particular field, numerous occasions have arisen for doubting the accuracy of reported results and, in general, accurate and painstaking efforts have shown many of these results to be decidedly in error.

Because of the inherent difficulties involved in using the accepted filter paper thimble and wet test meter for dust determinations, the company with which the author is associated has always adhered to a method devised by its own staff. This is a method which should appeal to all those familiar with this subject.

The conventional filter paper thimble is highly absorbent toward atmospheric moisture and hence exceedingly difficult to weigh accurately. It lacks uniformity of texture and density, frequently showing many very thin spots, and if moistened by condensing vapor during a test is very susceptible to rupture under application of vacuum to draw the gas sample through the filter. It may be questioned if any test using a filter paper cup is reliable.

In sampling primary cleaned gases, it is difficult to draw off the gases at a reasonable rate for an appreciable period of time without the filter fouling and the sampling velocity falling below its established rate. Attempts to increase the vacuum on the apparatus invariably cause trouble in the wet test meter. Furthermore, unless the sampling is closely attended and the filter maintained at a temperature well above the gas temperature, condensation of moisture will occur and the *soluble* solids caught on the filter will be leached out and never weighed. Leaks around the filter or a rupture frequently occur, adding greatly to the chances of error. For the most part the general run of errors tends to yield results indicating that the gas is much cleaner than it actually is.

In the Peabody test method a water suspension of acid washed and ignited short fiber asbestos is prepared and poured into a fine wire screen cylinder maintained under vacuum. As the suspension is poured in the water is immediately withdrawn, due to the vacuum, and a layer of asbestos of any desired thickness adheres tenaciously to the inside of the screen cylinder. This filter is readily dried and can be accurately weighed as it has no tendency to take up atmospheric moisture in the dry state. It can be made of uniform density and will withstand any degree of vacuum without a rupture. The sampled gas is adequately heated in passing through the filter and is measured by means of calibrated flow meters. If the gas to be sampled contains as much as 1/10-grain of dust per cubic foot it is washed free of all excess suspended matter, then filtered and measured. The solids trapped in the washing operation are determined separately and added to the amount found on the filter. This method calls for the operator's complete attention throughout the sampling period but is signally free of the difficulties and errors encountered in other methods.

No Standard Established

In view of the demand for fine-cleaned gas and the narrow range in which the low limits of cleaning must lie, it is strange that some one, tried and established method has not been adopted as a standard. In the absence of such a standard method, figures given for the low value of solids in fine-cleaned gas must necessarily be taken on faith. In other words, reported results may be considered "interesting if true."

In the course of the vast amount of test work this company has done, employing the above method and in all cases rigorously adhering to a standard procedure, it has been possible to co-ordinate test results and compare the gases from various furnace operations with respect to the ease or difficulty with which they may be cleaned within economic bounds.

It is a fact that with the same type of installation and for the same operating costs there may be, and likely will be, a decided difference in the extent to which the cases are cleaned. It is therefore fallacious to predict a specific degree of performance for the same equipment under any and all furnace operations. To do so is to deny the existence of different amounts of solids present, a difference in their degree of subdivision or of their character.

To illustrate this point, the accompanying chart represents the cleaning curves for blast furnace gases for five different furnaces.

(*Concluded on Page* 76)

Solids Content of Blast Furnace Gas from Six Secondary Cleaning Installations

Installation	Grains per Cubic Foot
A	0.021
B	0.074
C	0.013
D	0.011
E	0.019
F	0 030
Average	0.026

Night view, Atlantic City Auditorium

CLOSING DATES—Final forms will close Thursday, September 30. Reservation and copy requiring composition should be in Cleveland not later than Wednesday, September 15.

METALLURGISTS, metals and methods, together, make the annual Metal Shows events of utmost importance to all those working with metal whether it be iron, steel, copper, aluminum or some other metal.

The 1937 Metal Congress will be held in Atlantic City, October 18 to 22 inclusive. STEEL is working closely with the various interests in order that this show may be well attended and may accomplish its purpose. Our October 11 issue will be devoted largely to these same interests and will be in our readers' hands exactly one week prior to the show—ample time to make plans.

The traditional editorial and advertising insert section, which has proved so valuable over the years, will be a feature of the October 11 issue. This will serve to bring the show to those who cannot attend and will enable those attending to plan in advance the things they wish to do and see, thus insuring that their time will be spent to the best advantage.

Naturally, this studied readership makes for a most extraordinary advertising opportunity. The October 11 issue has all of the elements for successful advertising—timeliness, unusual reader interest, effective presentation to the proper people—plus additional distribution at the show. Write for further details now.

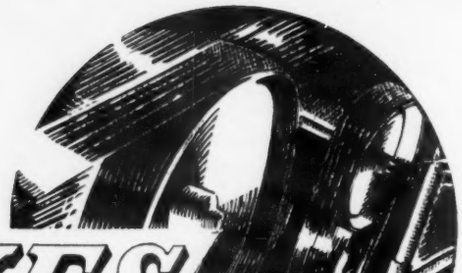
STEEL

Production • Processing • Distribution • Use

CLEVELAND

New York • Pittsburgh • Chicago • Detroit • Washington • London

POWER DRIVES



Repair Saves Large Gear

FIGHTING hard to hold production schedules while bedeviled with labor trouble, a large Detroit auto plant was faced with serious consequences when one of their giant fender presses broke a main drive gear. It was decided to repair, rather than to attempt to obtain a new one, but as the gear is cast iron it was obvious that welding would be difficult without danger of destruction.

The Universal Gear Works, Detroit, to whom the job was given, decided to braze the broken parts and cut new teeth. This was successfully accomplished. The first operation consisted of brazing in sufficient material in which to cut the new teeth.

The second operation consisted of cutting new teeth in the bronze sections, and when partially finished it was decided to take a clean-up cut over the entire gear. The repaired gear is provided with over 30 new bronze teeth out of the total of 175 teeth. It was necessary, of course, to move the pinion in a litttle closer to the gear, but as the gear tooth form is involute, this was a simple procedure.

The illustration shows this 70-inch pitch diameter gear, 10-inch face, 2½-inch diametrical pitch, as it appeared while new bronze teeth were being cut. The lighter portions are the bronze sections, and as the photograph was made before the final clean-up cut, the chips shown are bronze.

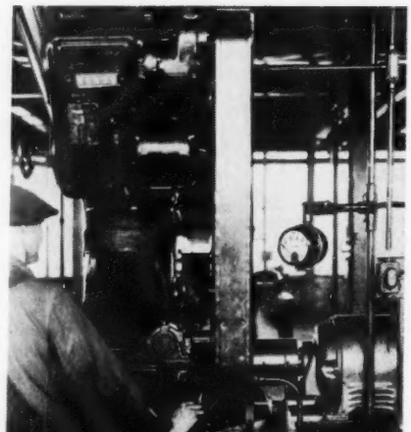
• • •

Use Visible Ammeter

ON SOME types of machines loading is ordinarily left to the judgment of the operator. This is particularly true of grinding or pulverizing mills, where the load and output is determined largely by the rate of feed, and also to a large extent with buffing or polishing heads and rough grinding or snagging operations on castings, where the work and load depends upon the pressure applied.

Without some means of knowing when the motor is fully loaded the operator cannot tell when to stop feeding until the unit chokes or the motor slows down. If the overload is continued either a circuit opens causing a temporary stoppage, or more disastrous effects result.

In some plants trials have been made of installing an indicating ammeter in the circuit to the individual motor on buffing, polishing or grinding heads so that the operator can see the amount of loading and when to stop "leaning" against the work at the wheel.

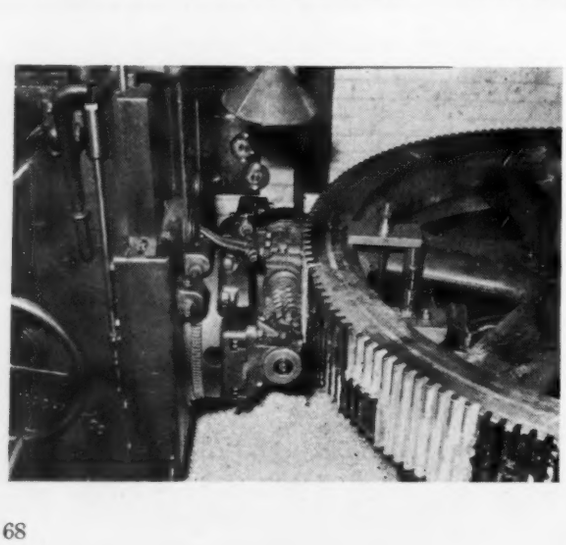


TO maintain full load on pulverizer with changing material, the operator watches the ammeter reading as he adjusts the feed

The accompanying illustration shows a similar application to a pulverizing mill at the General Aniline Works Inc., Rensselaer, N. Y. The capacity of the pulverizer varies with the kind of material being pulverized so the feeder is kept adjusted through the variable-speed transmission, upper left, to maintain full load on the drive motor for maximum efficiency and output.

So the operator may know when full load is obtained with a change of material and feed an indicating ammeter of the plug-in type is mounted in full view of the operator as he changes the feed control.

The pulverizer is powered by a 20-horsepower, 440-volt, 3-phase, 3600-revolutions per minute induction motor. Standard conduit fittings were used for mounting the



TO enable an auto plant to get back into production, over 30 new bronze teeth were brazed and recut on this large cast iron fender press gear

socket for the plug-in type, 50-ampere, 600-volt, 60-cycle self-contained detachable ammeter. The ammeter and the socket are sealed together by a tamper-proof sealing ring.

Such mounting and use of detachable instruments permits the elimination of costly panels and the quick interchange of other instruments to obtain voltage, amperes, watts, kilowatt-hours, power factor or other readings which may be desired at times. However, these instruments may be grouped on panels if desired. The plug-in type ammeter illustrated is manufactured by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

• • •

Automatic Nut Tightening

ONE way to obtain maximum production on many types of work is to design the drive of the machine to perform automatically some of the sequential cycle of operations.

In some cases the machine may be designed to perform automatically operations ordinarily requiring the exercise of judgment by the operator. Such operations are then performed without such variance as commonly results from the effects of strength or fatigue of the human factor.

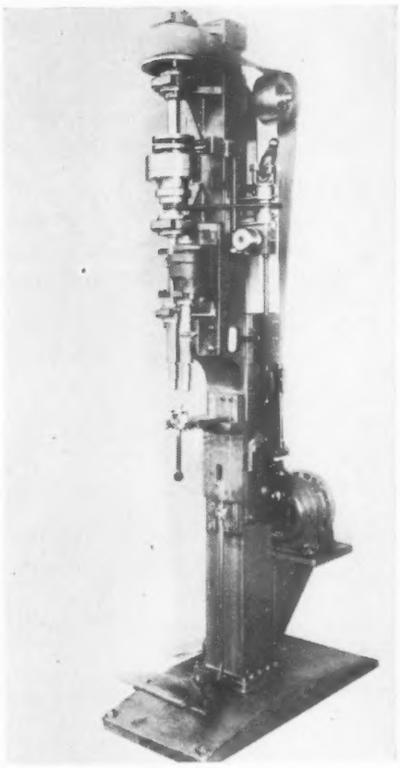
Tightening nuts on bolts in assembly is an example of the advantages of automatic control of tightness. A strong, husky workman may force them too tight, while a light and tired operator may leave them too loose.

Good example of the adaption of a drive to such operations is illustrated by the two-spindle automatic machine, shown in the accompanying illustration, which is built for tightening the clamping bolts in the crankshaft end of automotive piston rods.

A magnetic clutch, shown just below the drive pulley on the main vertical machine spindle, controls the tension or tightness of the nuts. The magnetic clutch is set to operate automatically at a predetermined stop. If this were left to the operator the nuts would not be set uniformly throughout the day..

The work placed in the holding fixture is brought into contact with the nut-running spindles by means of the foot treadle. The energized clutch drives the spindles and, through a differential arrangement, both nuts are run up to a predetermined tightness at the same time. When the nuts are tight, the lower or armature half of the clutch stops rotating and the centrifugal governor driven by it disconnects the electrical circuit to the magnet, thus opening the clutch.

The amount of torque transmitted by the clutch is adjustable by means of a variable resistor or rheostat in series with the magnetic clutch coil.



THROUGH a magnetic clutch set at a predetermined stop two piston rod nuts are tightened automatically

The magnetic clutch is manufactured by Stearns Magnetic Mfg. Co., Milwaukee, for use on a double-spindle tapping machine manufactured by Baush Machine Tool Co., Springfield, Mass.

• • •

Improving Chilled Car Wheels

(*Concluded from Page* 43)

shown in Figs. 3 and 4. Briefly, this describes the condition of the metal in the as-cast state and the final microstructure which is essential for uniformly strong wheels capable of withstanding service stresses and brake shoe applications. This investigation was begun in the laboratory by heat treating in excess of 300 test specimens, then casting test bars and subjecting them to tests in a testing machine, followed by casting and heat treating 8-inch wheels.

The accumulation of data from these investigations served as the foundation for final experimentation on standard wheels. A large electric heat treating furnace was installed which could be automatically controlled for both rate of temperature rise and temperature drop so that a predetermined cycle could be accurately reproduced. Standard wheels were taken directly from the mold, placed in the furnace and subjected to definite heat treating cycles.

The wheels were then tested by the usual methods applied in the foundry, such as the drop and thermal test, and many were tested in a 1,000,000-pound testing machine. These tests made it possible to obtain an accurate knowledge of the strength of the flange and plate of the wheel. This investigation has resulted in an increase of from 30 to 40 per cent and a uniformity in strength heretofore unobtainable.

The establishment of a definite heat treating cycle would be useless the wheel foundry was afforded facilities with which to accomplish these much improved results. To this end, the research staff developed what has been called a unit type of pit. This pit is constructed of low heat capacity, low thermal conductivity refractories scientifically designed so that the sensible heat within the wheel at the time of shake-out is conserved and the subsequent temperature drop automatically regulated to a preestablished rate.

A large number of these pits have already been installed and are in successful operation in many of the foundries and additional installations are in progress at the present time. This type of pit construction produces a minimum temperature gradient between center and end wheels in the same pit, requires no extraneous heat and is almost foolproof.

Even though this investigation has accomplished a great deal, experiments on heat treatment are still in process at the present time and further investigation will result in even further improvement.

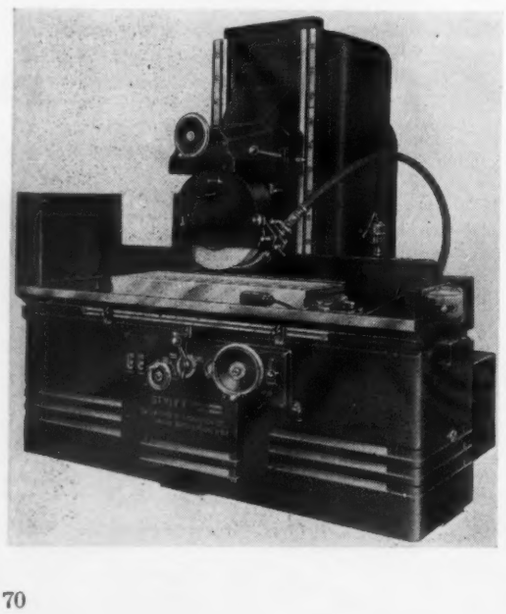
The laboratory, during the past 10 years, has made in excess of 1600 different individual experimental melts in a high-frequency induction furnace to investigate the effect of the usual elements and alloying materials on the physical properties of carwheel iron. Recently, a 3-phase arc furnace capable of melting 1800 pounds of metal at one time was installed. The information derived from the large number of small experimental heats will now be further expanded and full-size experimental car wheels cast from metal melted in the large electric furnace.

After making conclusive laboratory tests on these wheels, they will be put into service and their actual performance compared with the standard product of today. Thus the future holds forth an improved chilled car wheel, both in terms of composition, melting technique and heat treatment.

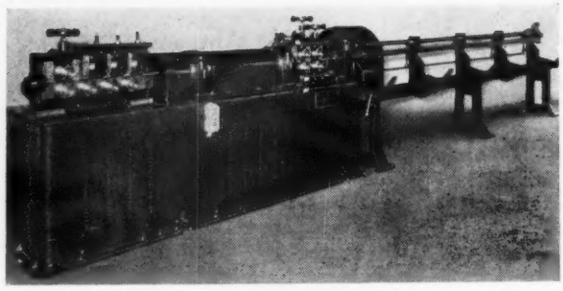
NEW EQUIPMENT

Surface Grinder—

Gallmeyer & Livingston Co., Grand Rapids, Mich., has placed on the market a new hydraulic feed, surface grinder of high speed, cross traveling head type. The cross traveling movement normally operates at each reversal of the table and the movement can be set from less than 1/32-inch up to 2 inches at each reciprocation of the table. Cross travel can be governed by adjustable dogs. The standard spindle drive is by means of a 25 horsepower, 1150 revolutions per minute motor which directly drives the spindle through a splined end. Thus the cross traveling mechanism is relieved of the weight of carrying this motor. The motor is mounted in a fixed position on the vertically-traveling head member. Power elevation of the vertically moving head slide is by a ½-horsepower motor which is controlled by a double throw switch. When switch handle is thrown up, head travels up; when handle is down, head travels down, but only remains operative as long as hand pressure is applied. Wet grinding equipment, for providing an adequate flow of coolant on the work, is standard. Coolant tank fits in a corner at rear of machine and is on rollers to facilitate removal to a convenient point for removing accumulated grit and dirt. Coolant is pumped by an independent motor on top of coolant tank as a copious flow is essential for satisfactory grinding on this type machine. An accessible hydraulic oil supply tank is in the base of the machine and a gage continuously registering the hydraulic pressure is mounted in the center of the base, as are all the operating controls.



Gallmeyer & Livingston hydraulic feed surface grinder is of the high speed cross traveling head type



No. 4A dual control machine feeds wire from the coil, straightens and cuts to accurate length

♦ ♦ ♦

Wire Cutting Machine—

F. B. Shuster Co., New Haven, Conn., has announced the No. 4A dual control machine, a modern unit that feeds wire from the coil, straightens it and cuts to accurate length. Machine is anti-friction equipped throughout and the possibility of marking or swelling the wire is practically eliminated. Variable speed units provide an infinite number of speed changes for the feed and cut-off and speeds can be changed without stopping the machine. The machine is of unit construction and has the preliminary straightening roll housing, feed roll unit, rotary flier, cut-off mechanism and variable speed units all mounted on one welded steel base. It has a preliminary roll straightener to remove the coil bow and rough straighten the wire before it enters the rotary flier. A standard 5 die steel rotary flier is used for the finishing operation and the straightening dies may be made of hard iron, bronze, babbitt or any other metal suitable for the wire being handled. The flier is equipped with square type straightening dies, and patented guides between, which permit feeding the wire through the machine. The gear drive for the preliminary rough straightener and the feed roll units are fully enclosed and run in oil. Machine can be furnished with a front feed roll unit containing a single pair of feed rolls, or with a double unit. Available in several sizes, the machine can be made a constant speed one, eliminating the variable speed units but retaining all the anti-friction and other engneerng features.

♦ ♦ ♦

Injection Molding Machine—

Index Machinery Corp., Cincinnati, has announced a new, fully auto-

PAGE

Hi-Tensile "C" Shielded Arc Electric Welding Electrodes are real "all position" rods

OVERHEAD POSITION

VERTICAL POSITION

FLAT POSITION

BUY ACCO QUALITY

A FEW OF THE 137 AMERICAN CHAIN & CABLE INDUSTRIAL PRODUCTS

AMERICAN CHAIN DIVISION
(DOMINION CHAIN COMPANY, Ltd., in Canada)
Weed Tire Chains • Welded and Weldless Chain • Malleable Castings • Railroad Specialties

AMERICAN CABLE DIVISION
Tru-Lay Preformed Wire Rope • Tru-Loc Processed Fittings • Crescent Brand Wire Rope Tru-Stop Brakes

ANDREW C. CAMPBELL DIVISION
Abrasive Cutting Machines • Floformers Special Machinery • Nibbling Machines

FORD CHAIN BLOCK DIVISION
Chain Hoists • Trolleys

HAZARD WIRE ROPE DIVISION
Green Strand Wire Rope • "Korōdless" Wire Rope • Preformed Spring-Lay Wire Rope • Guard Rail Cable

HIGHLAND IRON & STEEL DIVISION
Wrought Iron Bars and Shapes

MANLEY MANUFACTURING DIVISION
Automotive Service Station Equipment

OWEN SILENT SPRING COMPANY, Inc.
Owen Cushion and Mattress Spring Centers

PAGE STEEL AND WIRE DIVISION
Page Fence • Wire and Rod Products Traffic Tape • Welding Wire

READING-PRATT & CADY DIVISION
Valves • Electric Steel Fittings

READING STEEL CASTING DIVISION
Electric Steel Castings, Rough or Machined

WRIGHT MANUFACTURING DIVISION
Chain Hoists • Electric Hoists and Cranes

● Page Hi-Tensile "C" produces sound welds in any position—overhead, vertical or horizontal. It is easy to handle in crowded quarters. It permits high speed welding with low spatter or slag loss . . . equally good for production or shop work.

Welds made with Hi-Tensile "C" comply with the most rigid requirements. They meet tests of 65,000 to 75,000 pounds for tensile strength. They pass specifications for 20 to 30 per cent elongation, impact resistance of 30 to 70 foot pounds and fatigue resistance of 28,000 to 32,000 pounds per unit.

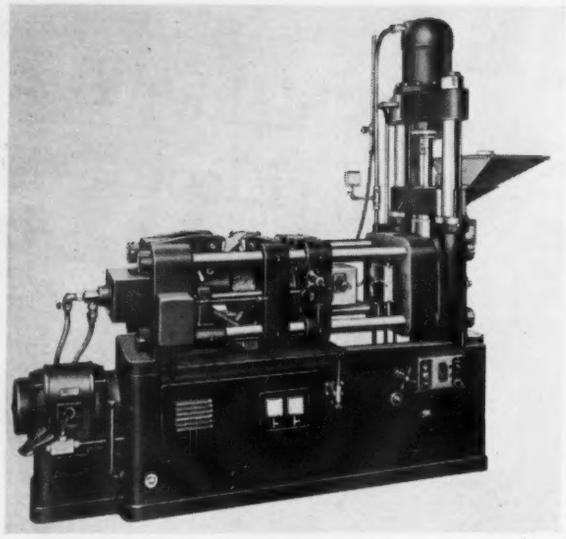
Like all Page Wires, Hi-Tensile "C" Electrodes are shop-tested. You can be sure of their uniformity and excellence.

Your local Page distributor carries an ample supply of Hi-Tensile "C" electrodes. He also has other Page Welding Wires . . . a complete line that meets every welding requirement. If you have a welding problem call on Page.

PAGE STEEL & WIRE DIVISION
AMERICAN CHAIN & CABLE COMPANY, Inc.
MONESSEN, PENNSYLVANIA
In Business for Your Safety

ACCO

PAGE *Welding* WIRE



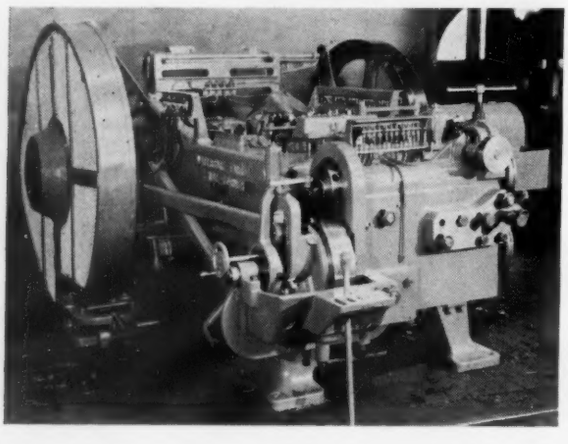
Index injection molding machine is a self-contained unit, ready for immediate operation upon installation of motor

matic and ruggedly constructed, Lester-designed injection molding machine to meet the requirements for the injection of larger articles with a maximum weight of 6 ounces per casting. For semi-automatic operation a single operating valve is provided. Full-automatic operations are controlled by two electric clocks. Molds are closed by hydraulic power operating toggle joints, and these joints are firmly locked by tapered surfaces when the mold is closed, which action removes all strains from the toggle pins and insures rigid locking of the molds during injection. As a result of this construction the machine is capable of holding molds closed for the injection of an area of 40 square inches. Adjustment of the mold on the tie bars is another feature. This is accomplished through use of a worm and worm wheel by which the die plates are advanced uniformly, thereby insuring absolute parallelism of the die plates on the tie bars at all times. The tie bars are 3¼ inches in diameter. The entire heating cylinder is chromium plated and is well constructed as all adjustments can be readily made, since the entire heating cylinder assembly swings away from the machine affording easy accessibility. The injection stroke of 8½ inches is accomplished in 3 seconds. The base serves as an oil reservoir and the machine is a self-contained unit ready for immediate operation upon installation of a 10-horsepower motor.

♦ ♦ ♦

Automatic Nut Machine—

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., recently introduced a new high speed, automatic machine for making double chamfered hexagonal nut blanks from cold drawn steel wire. Nuts are forged cold from the coil and the product is said to require no subsequent finishing other than tapping. Machines are built in two standard sizes—a ⅜-inch machine rated at 100 blanks a minute and a ½-inch machine rated at 80 a minute. They are driven by direct-geared motor and are supplied with a complete automatic lubricating system. Basically, they are multiple die, single stroke headers with automatic roll feed, cut-off and knock-out mechanisms, supplemented by a transfer device with fingers for carrying the blanks from station to station. The five operations required to make a nut blank are performed with a single stroke of the gate. Advantages claimed for these machines include high production, homogeneous grain structure throughout and small percentage of scrap.

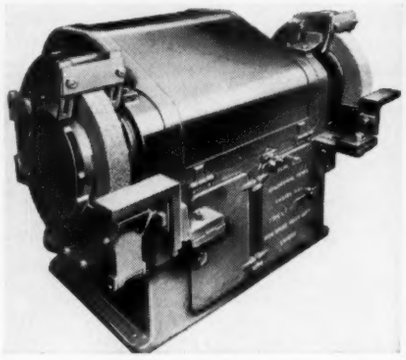


Waterbury Farrel machine makes double chamfered hexagonal nut blanks in one stroke

♦ ♦ ♦

Grinder—

Kling Bros. Engineering Works, 1301 North Kostner avenue, Chicago, has announced its new type AT grinder on which is introduced a wheel wear compensator. By turning a handle the wheel speed is increased, making it possible to maintain an approximate peripheral speed of 8500 surface feet per minute, overcoming the production drop-off in cleaning and snagging operations because of wheel wear. A handy push-button on front of the base actuates a magnetic switch inside. Motor shaft is mounted on the same plane as the wheel shaft to reduce vibration. Shaft is split for easy replacement of belts and is securely held together by a heavy coupling. Vari-Pitch Texrope sheaves with seven belts provide non-slip drive. Motor has a tension adjustment in the base. Large supporting bearings close to wheel chucks insure long bearing life and a streamlined exterior eliminates all angles where particles might lodge. A special work rest with pedal control is available with the type AT for production grinding.



Kling type AT grinder has a wheel wear compensator

♦ ♦ ♦

Single-Stage Compressor—

Gardner-Denver Co., Quincy, Ill., has announced an improved single-stage, horizontal air compressor for heavy duty, full load service and continuous, economical operation. Known as the RX compressor, the new unit is of totally-enclosed, dust-proof construction and is said to be easily accessible, accurately balanced and free from vibration. Important feature of the RX compressor is the electro-pneumatic control. With this control the compressor al-

HOT GALVANIZING

IS TO IRON AND STEEL

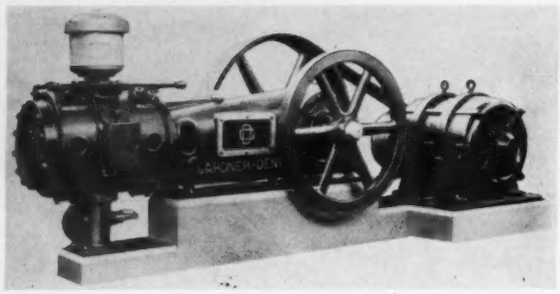
Modern steel like modern man cannot endure many of the conditions under which it must work . . . Efficient as it is, it is constantly susceptible to corrosive destruction and requires the natural guard given it by Hot Dip Galvanizing . . . There is no substitute for this process of protection because hot dipping assures a natural coating of approximately two and one-half ounces of zinc per square foot of surface . . . A thickness that service and science have shown to be ideal . . . A coating fused fast to the steel beneath becoming, in fact, a part of the product itself . . . Patronize members of this Association and know that you are getting definitely more protection per dollar of galvanizing cost. May we send you our interesting new booklet? Address American Hot Dip Galvanizers Association, Inc., American Bank Building, Pittsburgh, Pa.

IF IT CARRIES THIS SEAL IT'S A JOB WELL DONE

OFFICIAL • INSIGNIA
GALVANIZED PRODUCTS
PROTECTED BY GENUINE
HOT-DIP
GALVANIZING
AMERICAN HOT DIP GALVANIZERS ASSOCIATION INC.

BUY FROM THESE QUALIFIED MEMBERS

Acme Galvanizing, Inc., Milwaukee, Wis.
Acme Steel & Malleable Iron Works Buffalo, N. Y.
American Tinning & Galvanizing Co. Erie, Pa.
Buffalo Galvanizing & Tinning Works, Inc. Buffalo, N. Y.
Diamond Expansion Bolt Company, Inc. Garwood, N. J.
Enterprise Galvanizing Co., Philadelphia, Pa.
The Fanner Mfg. Company, Cleveland, Ohio
John Finn Metal Works, San Francisco, Cal.
Thomas Gregory Galvanizing Works Maspeth, N. Y.
Hanlon-Gregory Galvanizing Company Pittsburgh, Pa.
The Hodell Chain Company, Cleveland, Ohio
Independent Galvanizing Co., Newark, N. J.
International Derrick & Equipment Co Columbus, Ohio
Joslyn Co. of California, Los Angeles, Cal.
Joslyn Mfg. & Supply Co., Chicago, Ill.
L. O. Koven & Brother, Inc., Jersey City, N. J
Lehigh Structural Steel Co., Allentown, Pa.
Missouri Rolling Mill Corp., St. Louis, Mo.
The National Telephone Supply Co. Cleveland, Ohio
Penn Galvanizing Co., Philadelphia, Pa.
Riverside Foundry & Galvanizing Co. Kalamazoo, Mich.
The Sanitary Tinning Co., Cleveland, Ohio
Standard Galvanizing Co., Chicago, Ill.
Wilcox, Crittenden & Company, Inc. Middletown, Conn.
The Witt Cornice Co., Cincinnati, Ohio



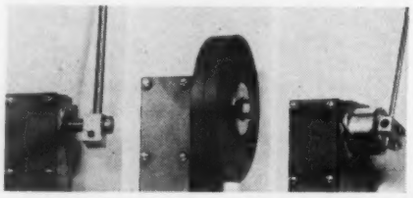
Gardner - Denver single-stage horizontal air compressor has electro-pneumatic control

ways starts unloaded and the air supply is adjusted automatically to fit the air requirements, resulting in part-load economy. The compressors are equipped with Timken tapered, adustable, roller main bearings.

♦ ♦ ♦

Super-Sensitive Switches—

National Acme Co., 120 East 131st street, Cleveland, is manufacturing a new super-sensitive line voltage switch that has many applications. It may be used as a limit or safety switch or in connection with counting devices, circuit breakers, liquid level controls, gage devices, relays, pressure controls or governors. This Namco switch is made in roller, push-button, plunger, light contact, rotary and oscillating types. The rotary switch is particularly adaptable where revolution contacts, linear measurement wheels and star wheels are to be used, while the light contact switch is used for applications requiring an extremely light touch to make or break the circuit. This switch may be actuated by a pressure of only one-ounce with a nine-inch lever. The oscillating type makes contact in one direction but not in the opposite and has many applications in the machine tool field. The plunger or push type switches require less than 1/16-inch movement for contact and allow an additional 3/16-inch for overtravel. They may be used as limit, safety or cam-operated switches. The rapid snap action of the contacts, the generous use of silver in both contacts to dissipate heat, and the size of the switch gap all make it possible for these switches to break large currents. The manufacturer claims it is not unusual for these switches to run several million contacts without failure and they have been successfully operated at speeds of more than 200 contacts per minute.

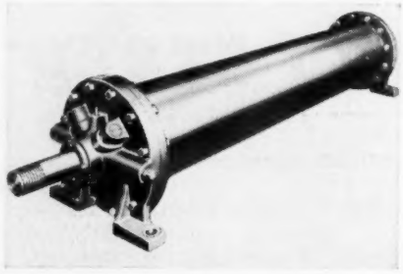


Namco switches above are light contact, rotary and oscillating types. Below are roller, push-button and plunger types

♦ ♦ ♦

Air Cylinders—

Hannifin Mfg. Co., 621 South Kolmar avenue, Chicago, has developed a new extra heavy type of air cylinder especially adapted to steel mill and other heavy duty applications. These new series LO heavy-duty air cylinders are honed to produce a mirror finish bore that is straight, round and concentric within 0.001-inch. Flanges of the cylinders are screwed on and then welded to the cylinder body. Heads are cast steel and are available with or without air cushion at either or both ends. The cylinders are being made in a full range of standard sizes up to 16-inch bore, for any length stroke and for air pressures up to 250 pounds. The cylinder illustrated is of 16-inch bore and 7-foot stroke and was recently delivered to an eastern steel mill.

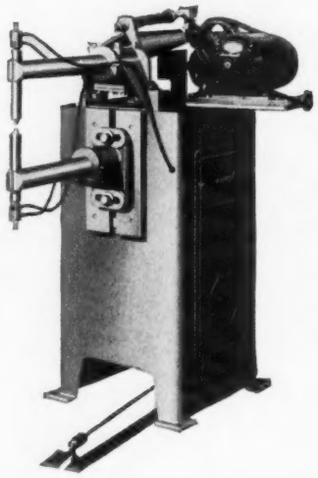


Hannifin air cylinder is adapted to steel mill and other heavy-duty applications

♦ ♦ ♦

Spot Welders—

Federal Machine & Welder Co., 212 Dana street, Warren, O., is bringing out an entirely new line of foot and automatically-operated spot welders known as the type R series. The line consists of eight machines ranging in kilovolt-ampere capacity from 7½ to 60 inclusive. Horn diameters vary from 1¾ inches up to 2¾ inches and can be supplied with throat depth of welder ranging from 6-inch minimum to 48-inch maximum by increments of 6-inches each. These welders can be furnished in foot-operated type or automatic or mechanically-operated type. Illustration shows the automatic type on which the automatic drive unit consists of a worm gear reduction and a Reeves variable speed unit driven by a fractional horsepower motor giving a 3 to 1 speed variation. Rocker arms and trunions are unusually sturdy. Face plates are of hard rolled copper and the lower horn socket is adjustable, having a 6-inch adjustment with the horn socket as shown in the illustration or an 8-inch adjustment by turning the horn socket upside down.



Typical of the new line of Federal welders is this automatic type

♦ ♦ ♦

Blade Grader—

Caterpillar Tractor Co., Peoria, Ill., has announced a new model No. 33 blade grader. This machine, equipped with a standard 8-foot blade, weights 5900 pounds and is similar in general design to Caterpillar No. 44 and No. 66 graders recently added to the line. The new unit offers unusual flexibility and rapidity of blade movement. The blade can be moved from a ditching to a high bank cutting position without offsetting the blade on the beams or making any changes in the supporting links. It is not necessary for the operator to leave his platform or stop the machine. This grader is best suited to the Caterpillar diesel RD4 tractor or other tractors of approximately 35 drawbar horsepower.

MATERIALS HANDLING

New Method of Binding Scrap Proves Profitable

(*Concluded from Page* 54)

published by Signode Steel Strapping Co., Chicago. A manufacturer who has quantities of scrap tin insufficient to warrant use of baling equipment recently purchased some ordinary wash tubs and placed one beside each of his can-making machines to serve as "waste baskets." The latter were taken out each night and emptied onto a large pile. When the accumulation was sufficiently large, it was sold to the scrap dealer.

One of the company executives borrowed an idea from his shipping department. Now two pieces of steel strap are laid at right angles across the bottom of each tub, with the ends extending up over the sides. The tin scrap piles up in the tub, is compressed from time to time by the operator, and, after the tub is filled, it is hauled away to the shipping room, where the straps are tightened and sealed around the bundle. As a result, tub-size bales are sold for a better price than that which was obtained formerly for the loose scrap.

Analysis of Income in Each State by Sources

Income Received in Various States, 1929-1935, cloth, 167 pages, 6 x 9 inches; published by National Industrial Conference board, New York; supplied by STEEL, Cleveland, for $3.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

A comprehensive and accurate picture is presented of the income of people in each state. It also points out the relative importance of wages and salaries, entrepreneurial income, dividends, interest and net rents and royalties in the total income in each state; the total income in each state derived from each major industry and from government; the industrial origin of salaries and wages and of entrepreneurial income in the various states.

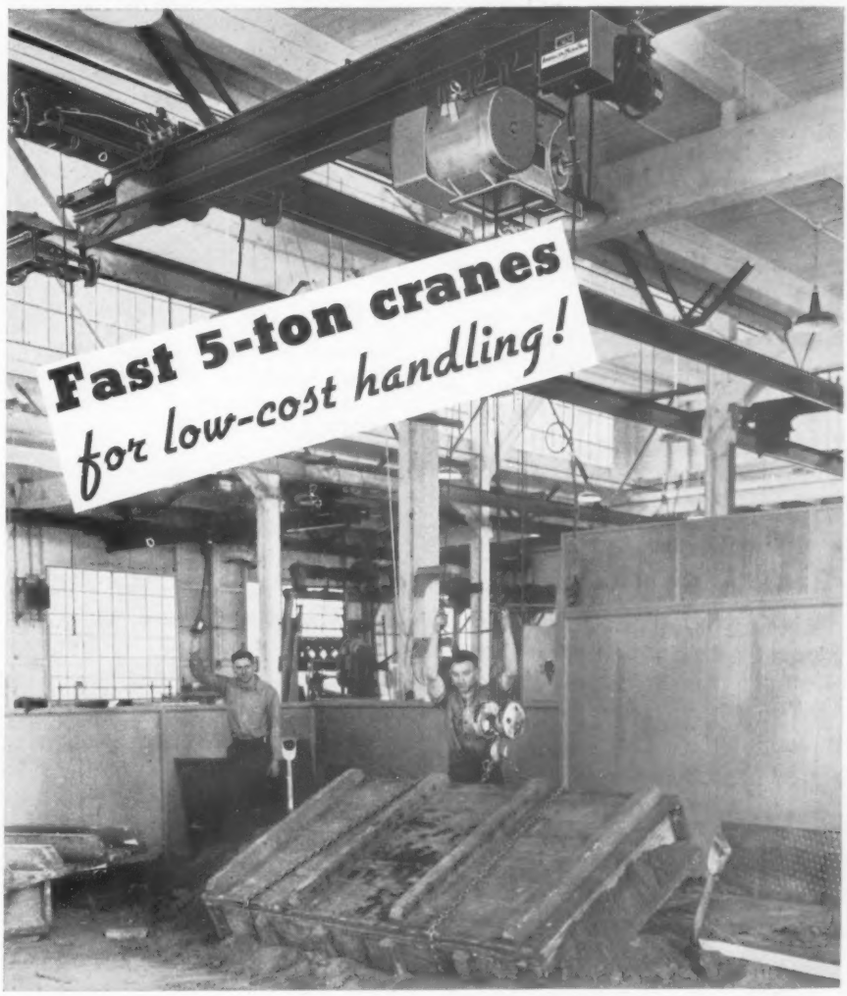
Revises Weld Chart

Lincoln Electric Co., Cleveland, is revising its engineering drafting room chart which provides, in reference form, data necessary for producing arc welded designs. Data given on the new chart includes latest weld symbols of the American Welding society, illustrations and particulars regarding the 16 types of joints for arc welding, illustrated suggestions for better arc welded design, sketches explaining the nomenclature of welds and a comparison of welded and riveted drawings, in addition to numerous other forms of useful information.

Publish Turbine Pump Data

Hydraulic Institute, 90 West street, New York, has recently published a deep well turbine pump section of Hydraulic Institute Standards. This new section discusses definitions of deep well turbine pump parts and materials, conditions of sale and definitions of efficiencies and methods of testing. Information on the causes of pumping troubles is a valuable section of the publication, as are charts and explanations of column friction losses and mechanical friction in turbine pump line shafts. Also included is a description of power balance, air line method of determining depth of water level, and the method of plumbing a well.

The section may be purchased separately or included with the complete book of Hydraulic Institute Standards.



These new cranes travel at 170 feet per minute with a five ton load. They operate over the entire plant area interlocking for passage of hoists from bridge to bridge. Cranes and hoists are propelled by low horse power MonoTractors all from floor control.

These rubber wheel drive units make low-cost handling possible. They have been successfully applied to all overhead trolley equipment with a wide variety of automatic controls. Engineering service is available without obligation.

Write for new book on MonoTractor drive for Overhead Handling

AMERICAN MONORAIL CO

13102 Athens Ave., Cleveland, O.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Oil Well Equipment—Bethlehem Steel Co., Bethlehem, Pa., has published a folder dealing with Bethlehem A.P.I. normalized sucker rods.

Metals, Thermostatic—Laminated Metals Corp., 775 Eddy street, Providence, R. I., has published a 12-page catalog on Tri-Ply and other thermostatic metals.

Materials Handling—Dodge Mfg. Co., Mishawaka, Ind., is mailing a folder dealing with a complete line of power transmission and belt conveyor equipment for foundries.

Sheet Metal Shears—Niagara Machine & Tool Works, 637 Northland avenue, Buffalo, N. Y., has issued bulletin HL illustrating the recently introduced series HL power squaring shears built in 6 to 12-foot cutting lengths with 10 gage capacity.

Pumps, Turbine — Roots-Connersville Blower Corp., Connersville, Ind., has issued bulletin 260-B11C illustrating and describing industrial turbine pumps with only one moving part and which are automatically sealed against leakage.

Electrical Equipment — Bull Dog Electric Products Co., Detroit, Mich., offers a new catalog dealing with Trol-E-Duct, movable electrical outlets for flexible wiring layouts. Thirty-eight pages describe and illustrate applications and equipment.

Materials Handling — Lewis-Shepard Co., 175 Walnut Street, Watertown, Mass., has made up folder No. 508 showing the uses and types of stackers, tiering machines and portable elevators for piling goods and products from floor to ceiling.

Pulleys—Link-Belt Co., 307 North Michigan avenue, Chicago, has completed its new illustrated list price book No. 1662 on the subject of cast iron pulleys for power transmission, giving data on solid and split, single and multiple arm machine-molded pulleys, with and without rubber lagging.

Hydraulic Equipment—Tomkins-Johnson Co., Jackson, Mich., has issued a file-size catalog of twenty-four pages illustrating and describing T-J hydraulic cylinders, power units and special equipment. There are many dimension and specification tables as well as an engineering data section.

Refractories — Quigley Co., 56 West 45th street, New York City, has two new bulletins off the press: bulletin No. 320 describing Insulcrete, a light weight insulating refractory cement, and a bulletin on Hearth-Crete, an endurable chrome-base, castable refractory for monolithic furnace bottoms, burner blocks, water-wall fill and other uses.

Pumps, Steam and Turbine—Fairbanks, Morse & Co., 900 South Wabash avenue, Chicago, has issued three pump bulletins. Bulletin 6920 covers oil-lubricated turbine pumps, bulletin 6920R deals with water-lubricated turbine pumps with enclosed impellers, and bulletin 6205 is on the subject of duplex steam pumps for boiler feed and general service.

Co-operative Effort Solves Finishing Problems

(*Concluded from Page* 59)

have been developed to the point where they closely approach black in permanence, and in 1938 it is understood several more colors will have been improved to this point.

Looking ahead ten years in automotive finishes, Mr. Phillips foresees certain changes in materials, and, as before stated, there have been steady improvements in methods of application and preparation of surfaces. These improvements are expected to continue, and finishes are, therefore, likely to become more and more permanent.

Steel, with improved drawing and forming properties, gives better surfaces for either painting or plating, and this, together with improvements in the surface finish of the steel, will help in giving the car owner more satisfactory and durable finishes.

Condensation Cleaning

(*Concluded from Page* 65)

In each case the results are averages from a number of specific determinations, and the data were secured by intensively cleaning the gases in a series of separate but altogether similar units. The amount of solids removed in each unit was determined separately as well as the amount remaining in the gases after treatment. It is to be observed that for the same expenditure of energy in each case the rate of dust removal is different. And were an infinite number of cleaning units employed, the final results would still be different.

Establish Significant Fact

This work, only a portion of the whole, established a significant fact, which is that the solids removed in a series of cleaning stages, irrespective of their character, follow a geometrical progression. That is to say, in each successive unit the solids removed will be a constant fraction of that removed in the preceding unit. Carefully conducted work by others has verified this law.

Whereas the dust removed stage by stage is a geometrical progression, the cleaning curves in the chart actually are exponential functions. As the solids content of the cases in each case diminishes a final residual and limiting solids content is approached. It is this limiting quantity of residual solids which is considered here. It will be noticed that the curves have not been extended to the limit in each case as this is unnecessary. Sufficient test data is collected accurately to determine the slope of the curve and the residual solids limit is readily found by solving the equation for each particular case.

The accompanying table shows solids content of blast furnace gas as determined in a series of tests made on different secondary cleaning installations, designated by letters. This should be compared with the final average limit of cleaning for the curves given. This comparison indicates the reliability of this method of determining the economic low limit of cleaning in light of the limit that may be reliably expected on the whole.

The practical value of these tests should be in the disclosure of another and decidedly meritorious method of cleaning blast furnace gas, which requires a minimum of equipment and capital expenditure. Cleaning of blast furnace gas involves no deep nor dark mystery known only to one special cult, but is rather a clear cut proposition calling for the expenditure of certain energy in a specifically directed way for the attainment of a definite result. The practical and economic limit to which gas may be cleaned is peculiar to each operation and no arbitrary limit can be established as a yardstick for measuring performance without due regard to cost in each particular case.

Steel Production Settles to Seasonal Rate

Pig Iron Prices Extended; Scrap In Further Rise

MARKET IN TABLOID

DEMAND . . . . *Light but some revival seen.*

PRICES . . . . *Steady, pig iron prices continue for fourth quarter delivery.*

PRODUCTION . . *Operations down 3 points to 81 per cent of capacity*

SHIPMENTS . . . *Steady in most lines.*

STEELMAKING is at the crossroads for this season and the next ten days to two weeks are expected to indicate the trend for the fall months. Most indications are for a turn to the right, with resumption of satisfactory buying and an active period.

Although the production rate is declining from the level of early August, production at that time was beyond ordinary midsummer experience and the slackening of the present is to a more normal condition. However, part of the present decline is attributed to need for repair to steelmaking equipment which has had unusually severe treatment for several months. Weakening of demand for deliveries has been welcomed as an opportunity to place equipment in condition for an expected active fall campaign. Finishing departments continue at a high rate.

Steelworks operations last week declined 3 points to 81 per cent of capacity. At Chicago a rise of 0.5 point to 86.5 brought the highest point of the year. At St. Louis a rise of 7 points to 84 per cent, at Cincinnati 4 points to 93 and in New England 10 points to 75 reflected rising activity. Pittsburgh declined 3.5 to 79.5, Eastern Pennsylvania 4 to 65, Youngstown 5 to 73, Wheeling 4.8 to 89.2, Cleveland 5.5 to 79.5, Detroit 5 to 95. No change was made in the rate at Buffalo at 86 and Birmingham 96.

Some quickening of buying has appeared in almost every market area and in many lines of production but it has not been sufficient to balance shipments, though in some instances it has come close to that point.

Shipyard strikes in eastern Pennsylvania were ended late last week by workers voting to return. This will release considerable plate tonnage, which has been held back since the strike started in June. Specifications for ship material are expected to begin to reach mills this week and should aid production schedules in that area.

Interruption to trade in China by the Sino-Japanese struggle at Shanghai is not expected to have great effect on trade as observers familiar with the situation believe Japan will retire as soon as she can do so without loss of face, as China is one of her best customers.

Seasonal tapering of automotive production is evident, though not at a rapid rate, last week producing 93,339 units, compared with 103,250 the preceding week. Practically all this shrinkage was in General Motors lines, a drop from 41,865 to 32,954; Ford was steady with 26,000 each week and Chrysler made 26,600 compared with 26,900 the previous week; production by all other makers totaled 7785, compared with 8425 the week before. Assemblies of 1937 models will be practically ended by the beginning of September and first of the 1938 models will appear. With this transition specifications for steel will be resumed by the automobile industry.

Practically all pig iron producers have opened books for fourth quarter delivery without change in price. This action is somewhat earlier than usual and consumers are beginning to make reservations, in view of the fact that an increase in price may be made later, as was done during first quarter of this year. In fact, some producers have made it plain that present opening of books for fourth quarter does not preclude a later advance, which probably would be effective immediately on announcement.

While scrap is marking time in the absence of large buying, much strength is evident, as yard stocks are small and relatively little material is coming into the market. Heavy melting steel at Pittsburgh has advanced 50 cents on a tonnage purchase, indicating the underlying strength awaiting heavy demand to bring a higher range. Some scrap observers believe considerably higher prices will prevail by mid-autumn.

Because of the advance at Pittsburgh the composite price of scrap rose 17 cents last week, to $20.50, a few cents higher than at the end of April. The same influence brought a rise of 4 cents in the iron and steel composite, to $40.36. The finished steel composite remains unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Aug. 21	Aug. 14	Aug. 7	One Month Ago July, 1937	Three Months Ago May, 1937	One Year Ago Aug., 1936	Five Years Ago Aug., 1932
Iron and Steel	$40.36	$40.32	$40.32	$40.03	$40.06	$33.88	$28.77
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.40	47.46
Steelworks Scrap ..	20.50	20.33	20.33	18.51	18.49	14.66	6.25

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Aug. 21, 1937	July 1937	May 1937	Aug. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	1.95c
Steel bars, Chicago	2.50	2.50	2.50	2.00
Steel bars, Philadelphia	2.74	2.74	2.74	2.26
Iron bars, Terre Haute, Ind	2.35	2.35	2.35	1.85
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.11½
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.43½	2.43½	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.50
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.05
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.60
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.40
Tin plate, per base box, Pitts.	$5.35	5.35	5.35	5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.10

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$30.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	30.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	30.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	38.00

Pig Iron

	Aug. 21, 1937	July 1937	May 1937	Aug. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$20.81
Basic, Valley	23.50	23.50	23.50	19.00
Basic, eastern del. East Pa.	25.26	25.26	25.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.31
No. 2 fdy., Chicago	24.00	24.00	24.00	19.50
Southern No. 2, Birmingham	20.38	20.38	20.38	15.50
Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
No. 2X eastern, del. Phila.	26.135	26.135	26.135	21.68
Malleable, Valley	24.00	24.00	24.00	19.50
Malleable, Chicago	24.00	24.00	24.00	19.50
Lake Sup., Charcoal, del. Chicago	30.04	30.04	30.04	25.2528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.67
Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13

Scrap

Heavy melting steel, Pittsburgh	$22.25	$19.40	$19.55	$16.00
Heavy melt. steel, No. 2, East Pa.	18.00	16.55	16.85	12.80
Heavy melting steel, Chicago	19.75	17.75	17.55	15.45
Rail for rolling, Chicago	21.75	20.30	21.45	16.40
Railroad,steel specialties, Chicago	22.25	20.20	21.35	16.65

Coke

Connellsville, furnace ovens	$4.50	$4.50	$4.85	$3.45
Connellsville, foundry, ovens	5.30	5.30	5.30	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, del.	3.84c
New York, del.	3.88c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke, (base box), Pittsburgh	$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2,85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Moline, Ill.	2.35c
Cleveland	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.60c
Gulf ports	2.65c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.84c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young.	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to straight or mixed carloads; less carloads $5 higher; less carloads fencing $5 over base column.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. l.)	$74.00
Single loop bale ties, (base column, c. l.)	63.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot rolled, 25-1ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23½-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$5.75 off

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk. Steel	Galv. Steel
½	59½	49
¾	62½	53
1—3	64½	55½
Iron		
¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel		
2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50
Iron		
2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9–12	24½	10

Line Pipe

Steel		
1 to 3, butt weld	63½	
2, lap weld	56	
2½ to 3, lap weld	59	
3½ to 6, lap weld	61	
7 and 8, lap weld	60	
10-inch, lap weld	59½	
12-inch, lap weld	58½	

Butt Weld

	Blk. Iron	Galv. Iron
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	.....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2½" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Bham.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 11/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.40- 4.60
Connellsville, fdry.	5.25- 5.50
Connell. prem. fdry.	6.00- 6.50
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.25
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	14.75c
do. (450 lbs.)	14.00c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$28.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	.....	24.46	.....
Boston from Birmingham	26.37	.....	25.87	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	.....	.....
Brooklyn, N. Y., from Bmghm.	27.05	.....	.....	.....
Canton, O., from Cleveland	25.26	25.26	25.76	25.76
Chicago from Birmingham	24.22	.....	24.10	.....
Cincinnati from Hamilton, O.	24.07	25.01	24.51	.....
Cincinnati from Birmingham	23.69	.....	22.69	.....
Cleveland from Birmingham	24.12	.....	23.62	.....
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	25.26
Milwaukee from Chicago	25.00	25.00	24.50	25.00
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	.....	.....	.....
Newark, N. J., from Bethlehem	26.39	26.89	.....	.....
Philadelphia from Birmingham	25.38	.....	25.26	.....
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	25.75
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$21.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.29
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.80-1.85
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorous, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Aug. 14	14.00	14.12½	13.75	60.00	59.50	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 16	14.00	14.12½	13.75	59.50	59.00	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 17	14.00	14.12½	13.75	59.62½	59.12½	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 18	14.00	14.12½	13.75	59.50	59.00	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 19	14.00	14.12½	13.75	59.37½	58.87½	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 20	14.00	14.12½	13.75	59.50	58.87½	6.50	6.35	7.25	20.00	15.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper

Sheets

Yellow brass (high)	19.75
Copper, hot rolled	21.87½
Lead, cut to jobbers	10.00
Zinc, 100-lb. base	12.25

Tubes

High yellow brass	22.50
Seamless copper	22.62½

Rods

High yellow brass	16.25
Copper, hot rolled	18.62½

Anodes

Copper, untrimmed	19.12½

Wire

Yellow brass (high)	20.00

OLD METALS

Nom. Deal, buying prices

No. 1 Composition Red Brass

New York	9.00- 9.25
Cleveland	9.25-9.50
*Chicago	9.50-9.75
*St. Louis	9.00-9.25

Heavy Copper and Wire

*New York, No. 1	11.25-11.50
*Cleveland, No. 1	11.00-11.25
*Chicago, No. 1	11.25-11.50
*St. Louis, No. 1	11.00-11.25

Composition Brass Borings

New York	8.50-8.75

Light Copper

*New York	9.00-9.25
*Cleveland	9.00-9.25
*Chicago	9.25-9.50
*St. Louis	9.25-9.50

Light Brass

*Cleveland	5.25-5.50
*Chicago	6.25-6.50
*St. Louis	5.75-6.00

Lead

New York	5.75
*Cleveland	4.50-4.75
Chicago	5.50-5.62½
St. Louis	4.50-4.75

Zinc

New York	3.50- 3.75
*Cleveland	3.00-3.25
St. Louis	3.25-3.50

Aluminum

Borings, Cleveland	9.75-10.00
Mixed cast, Cleve.	12.75-13.00
Clips, soft, Cleve.	14.75-15.00
Mixed cast, St. L.	12.25-12.75

SECONDARY METALS

*Brass, ingot 85-5-5-5, lcl,	14.25
Stand. No. 12 alum.	18.50

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.10c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.35c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.47c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ¼-in. and over	3.86c
Detroit	3.95c
Detroit, ¼-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Boston (g)	4.00c
Buffalo	3.72c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	3.35c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	4.10c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	3.52c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ¼-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	3.52c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	3.70c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.39c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	69c
High carbon, Cr	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	65
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Aug. 19

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
			Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON	£ s d			£ s d
Foundry, 2.50-3.00 Silicon	$30.56	6 2 6	$23.96	3 0 0
Basic bessemer	19.59	3 18 6*	28.75	3 12 0
Hematite, Phos. .03-.05	36.18	7 5 0	.....	.....
SEMIFINISHED STEEL				
Billets	$39.30	7 17 6	$26.96	3 7 6
Wire rods, No. 5 gage	54.02	10 16 6	51.92	6 10 0
FINISHED STEEL				
Standard rails	$50.52	10 2 6	$45.92	5 15 0
Merchant bars	2.45c	11 0 0	2.16c to 2.26c	6 0 0 to 6 5 0
Structural shapes	2.37c	10 12 6	1.94c	5 7 6
Plates, †¼ in. or 5 mm.	2.58c	11 11 3	2.57c	7 2 6
Sheets, black, 24 gage or 0.5 mm	3.35c	15 0 0	3.17c	8 15 0
Sheets, gal., 24 gage, corr.	4.18c	18 15 0	4.07c	11 5 0
Bands and strips	3.07c	13 15 0	2.35c	6 10 0
Plain wire, base	4.35c	19 10 0	2.53c	7 0 0
Galvanized wire, base	4.52c	20 5 0	3.17c	8 15 0
Wire nails, base	4.13c	18 10 0	2.89c	8 0 0
Tin plate, box 108 lbs.	6.24	1 5 0	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$25.20	5 1 0(a)	$17.37	462	$27.80	825	$25.35	63
Basic bessemer pig iron	24.95	5 0 0(a)	10.34	275	14.66	435	27.97 (b)	69.50
Furnace coke	8.73	1 15 0	5.94	158	6.23	185	7.65	19
Billets	39.30	7 17 6	24.63	655	32.35	960	38.83	96.50
Standard rails	2.26c	10 2 6	1.66c	975	1.80c	1,200	2.38c	132
Merchant bars	2.55c	11 9 0	1.50c	885	1.65c	1,100	1.98c	110
Structural shapes	2.46c	11 0 6	1.46c	860	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.61c	11 14 3	1.88c	1,105	2.06c	1,375	2.29c	127
Sheets, black	3.51c	15 15 0§	2.47c	1,450‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.35c	19 10 0	3.66c	2,150	2.85c	1,900	6.66c	370
Plain wire	3.23c	14 10 0	2.31c	1,360	2.49c	1,650	3.11c	173
Bands and strips	2.72c	12 4 0	1.70c	1,000	2.33c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlesbrough. b hemetite. ††Close annealed.

**Gold pound sterling carries a premium of 64 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham†, No. 1	16.00-17.00
Birmingham†, No. 2	15.00-16.00
Bos. dock No. 1, exp.	18.00-18.50
N. Eng. del. No. 1..	17.25
Buffalo, No. 1	21.00-21.50
Buffalo No. 2	18.50-19.00
Chicago, No. 1	19.50-20.00
Cleveland, No. 1 ..	19.50-20.00
Cleveland, No. 2 ...	18.00-18.50
Detroit, No. 1	17.00-17.50
Eastern Pa., No. 1	19.50-20.00
Eastern Pa., No. 2.	18.00
Federal, Ill.	15.50-16.00
Granite City, R. R.	17.50-18.00
Granite City, No. 2	15.50-16.00
New York, No. 1...	†16.50-17.00
N. Y. dock No. 1 exp.	17.00-17.50
Pitts. No. 1 (R. R.)	23.50-24.00
Pitts., No. 1 (dlr.).	22.00-22.50
Pittsburgh, No. 2 ..	19.50-20.00
St. Louis, R. R.	17.50-18.00
St. Louis, No. 2	15.50-16.00
Toronto, dlrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	21.00-22.00

COMPRESSED SHEETS

Buffalo, dealers ...	18.50-19.00
Chicago, factory...	19.00-19.50
Chicago, dealer ...	18.00-18.50
Cleveland	19.00-19.50
Detroit	18.00-18.50
E. Pa., new mat...	19.50-20.00
E. Pa., old mat.	15.50-16.00
Pittsburgh	22.00-22.50
St. Louis	15.00-15.50
Valleys	20.50-21.00

BUNDLED SHEETS

Buffalo	14.00-14.50
Cincinnati, del	15.00-15.50
Cleveland	14.00-14.50
Pittsburgh	19.00-19.50
St. Louis	14.00-14.50
Toronto, dealers ...	8.00

SHEET CLIPPINGS, LOOSE

Chicago	13.75-14.25
Cincinnati	14.00-14.50
Detroit	13.25-13.75
St. Louis	12.50-13.00

STEEL RAILS, SHORT

Birmingham	17.00-18.00
Buffalo	24.00-25.00
Chicago (3 ft.)....	21.50-22.00
Chicago (2 ft.)	23.00-23.50
Cincinnati, del.	23.50-24.00
Detroit	22.50-23.00
Pitts, 3 ft. and less	26.50-27.00
St. Louis, 2 ft. & less	20.00-20.50

STEEL RAILS, SCRAP

Boston district ....†15.50-15.75	
Buffalo	21.00-21.50
Chicago	19.50-20.00
Cleveland	21.00-21.50
Pittsburgh	23.00-23.50
St. Louis	21.00-21.50

STOVE PLATE

Birmingham	10.00-10.50
Boston district ....†11.50-12.00	
Buffalo	15.00-16.00
Chicago	11.00-11.50
Cincinnati, dealers.	12.50-13.00
Detroit, net	12.25-12.75
Eastern Pa.	16.00-16.50
New York fdry. ..†12.00-12.50	
St. Louis	12.50-13.00
Toronto, deal'rs, net	9.50-10.00

SPRINGS

Buffalo	22.50-23.00
Chicago, coil	24.50-25.00
Chicago, leaf	22.50-23.00
Eastern Pa.	24.00-24.50
Pittsburgh	27.00-27.50
St. Louis	22.00-22.50

ANGLE BARS—STEEL

Chicago	21.50-22.00
St. Louis	20.00-20.50

RAILROAD SPECIALTIES

Chicago	22.00-22.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	23.00-23.50
Cleveland, billet, bloom crops	24.50-25.00
Eastern Pa., crops..	25.00-25.50
Pittsburgh, billet, bloom crops	26.50-27.00
Pittsburgh, sheet bar crops	26.50-27.00

FROGS, SWITCHES

Chicago	19.50-20.00
St. Louis, cut	19.50-20.00

SHOVELING STEEL

Federal, Ill.	15.50-16.00
Granite City, Ill. ..	15.50-16.00
Toronto, dealers....	9.00- 9.50

RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district ...†10.00-10.25	
Buffalo, No. 1	17.50-18.50
Buffalo, No. 2	21.00-21.50
Chicago, No. 1 net.	16.00-16.50
Cincinnati, No. 2..	18.50-19.00
Eastern Pa., No. 1..	21.00-21.50
St. Louis, No. 1	15.50-16.00
St. Louis, No. 2	17.50-18.00
Toronto, No. 1 dlr...	15.00

SPECIFICATION PIPF

Eastern Pa.	17.00-17.50
New York .....†12.50-13.00	

BUSHELING

Buffalo, No 1	17.50-18.50
Chicago, No. 1	17.50-18.00
Cincin., No. 1, deal..	15.50-16.00
Cincinnati, No. 2...	10.00-10.50
Cleveland, No. 2...	13.50-14.00
Detroit, No. 1 new	16.50-17.00
Valleys, new, No. 1	19.50-20.00
Toronto, dealers....	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	12.00-12.50
Chicago	10.50-11.00
Cincinnati, dealers.	12.00-12.50
Cleveland	13.00-13.50
Detroit	13.00-13.50
Eastern Pa.	14.00-14.50
New York.....†10.00-10.50	
Pittsburgh	15.25-15.75
St. Louis	10.00-10.50
Toronto, dealers....	8.00- 8.50
Valleys	15.50-16.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†9.50- 9.75

BORINGS & TURNINGS

Buffalo	13.00-13.50
Cincinnati, dealers.	11.50-12.00
Cleveland	14.00-14.50
Detroit	13.50-14.00
Eastern Pa.	13.00-13.50
New York .....†10.00-10.50	
Pittsburgh	15.50-16.00
Toronto, dealers....	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00- 8.50
Boston dist. chem..†10.00-10.25	
Bos. dist. for mills†10.00-10.25	
Buffalo	13.00-13.50
Chicago	12.50-13.00
Cincinnati, dealers.	11.50-12.00
Cleveland	13.50-14.00
Detroit	13.50-14.00
E. Pa., chemical....	14.50-15.00
New York .....†10.00-10.50	
St. Louis	9.50-10.00
Toronto, dealers....	9.00

PIPE AND FLUES

Cincinnati, dealers.	13.00-13.50
Chicago, net	13.50-14.00

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	12.50-13.00
Cincinnati	12.50-13.00
Eastern Pa.	16.00-16.50
New York .....†12.00-12.50	
St. Louis	12.50-13.00

FORGE FLASHINGS

Boston district	12.75-13.00
Buffalo	17.50-18.50
Cleveland	17.50-18.00
Detroit	15.50-16.00
Pittsburgh	18.25-18.75

FORGE SCRAP

Boston district	†9.50-10.00
Chicago, heavy	21.50-22.00

ARCH BARS, TRANSOMS

St. Louis	20.00-20.50

AXLE TURNINGS

Boston district .....†11.00-11.50	
Buffalo	16.00-16.50
Chicago, elec. fur...	17.50-18.00
Eastern Pa.	18.00-18.50
St. Louis	14.00-14.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	22.50-23.00
Boston district ....†24.00-25.00	
Chicago, net	25.50-26.00
Eastern Pa.	25.00-26.00
St. Louis	24.00-24.50

SHAFTING

Boston district ....†19.25-19.50	
New York .....†19.50-20.00	
Eastern Pa.	24.50-25.00
St. Louis	19.50-20.00

CAR WHEELS

Birmingham	18.00-19.00
Boston dist., iron...†15.00-15.25	
Buffalo, iron	19.00-19.50
Buffalo, steel	23.00-23.50
Chicago, iron	20.50-21.00
Chicago, rolled steel	22.00-22.50
Cincinnati, iron ...	19.50-20.00
Eastern Pa., iron..	20.50-21.00
Eastern Pa., steel..	25.50-26.00
Pittsburgh, iron ..	22.00-22.50
Pittsburgh steel ...	27.00-27.50
St. Louis, iron.....	20.00-20.50
St. Louis, steel.....	21.50-22.00

NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.†15.00-15.50	
N. Eng. del. No. 2	17.00
N. Eng. del. textile.	18.50
Buffalo, cupola	18.00-18.50
Buffalo, mach.	19.00-20.00
Chicago, agri. net..	14.00-14.50
Chicago, auto	15.00-15.50
Chicago, mach. net.	16.50-17.00
Chicago, railr'd net	15.00-15.50
Cincin., mach. cup.	17.50-18.00
Cleveland, mach....	19.50-20.50
Eastern Pa., cupola.	21.00-21.50
E. Pa., mixed yard..	18.00
Pittsburgh, cupola.	20.25-20.75
San Francisco, del..	13.50-14.00
Seattle	12.00-13.00
St. Louis, No. 1....	14.50-15.00
St. L., No. 1, mach.	15.00-15.50
Toronto, No. 1, mach., net	16.00-17.00

HEAVY CAST

Boston dist. break..†14.75-15.00	
N. Eng. del.	15.00-15.25
Buffalo, break.	16.00-16.50
Cleveland, break. ..	17.00-18.00
Detroit, break.	14.50-15.00
Detroit, auto net..	16.00-16.50
Eastern Pa.	19.50-20.00
New York, break..†15.00-15.50	
Pittsburgh	17.50-18.00

MALLEABLE

Birmingham, R. R...	12.50-13.50
New England, del...	20.00
Buffalo	20.00-21.00
Chicago, R. R.	21.50-22.00
Cincin., agri. del. ..	18.50-19.00
Cleveland, rail.....	21.50-22.00
Detroit, auto	17.00-17.50
Eastern Pa., R. R...	20.00-20.50
Pittsburgh, rail	21.50-22.00
St. Louis, R. R.....	20.00-20.50

RAILS FOR ROLLING

5 feet and over

Birmingham	19.00-20.00
Boston	†17.50-18.00
Buffalo	22.00-23.00
Chicago	21.50-22.00
Eastern Pa., R. R...	21.00-21.50
New York .....†19.00-19.50	
St. Louis	21.00-21.50

LOCOMOTIVE TIRES

Chicago (cut)	22.50-23.00
St. Louis, No. 1....	19.50-20.00

LOW PHOS. PUNCHINGS

Buffalo	22.50-23.50
Chicago	22.00-22.50
Eastern Pa.	26.00-26.50
Pittsburgh (heavy)	25.00-25.50
Pittsburgh (light) .	23.50-24.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer.....	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man.	•17.00
No. Afr. low phos..	20.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	•16.00
Tungsten, Nov.-Dec. sh. ton, unit, duty pd.	nominal
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f...	$25.50-26.50

•Nominal asking price for spot.

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%.. .....non. .52.00 to 53.00

So. African, 50-52% .....non. 52.00 to 53.00

Indian, 50-52% .....Nominal

Sheets

Sheet Prices, Page 78

Pittsburgh—Sheet mills continue to work off their backlogs at varying rates but the general average of independents is that 3 to 4 weeks operations are assured. The leading flat-rolled interest still has a backlog of eight weeks on hot-rolled and 10 to 12 weeks on galvanized. Mills expect releases on automobile sheets for new models will be well on the way by the middle of September. Automotive partsmakers continue to figure with mills for supplies of sheets but have placed few orders as yet for new model material. Jones & Laughlin Steel Corp. is preparing to enter the market as a producer of galvanized sheets.

Cleveland — Deliveries of certain finished sheets remain at 6 to 8 weeks, due in part to delay in pickling operations. Of the usual hot and cold-rolled material shipments can be had within four weeks. To date only a little tonnage has been placed from automotive sources for 1938 models. In some instances it is difficult to distinguish between requirements for 1937 and 1938 models due to the slight change in design.

Chicago—Sheet mills continue to reduce backlogs and a change in this situation is not anticipated until automotive interests re-enter the market. A gain in buying of automotive material is in prospect within the next two weeks and backlogs are sufficient to assure continued heavy output through the remainder of the quarter. Farm implement and tractor companies show no letdown in their requirements but the season still is restricting consumption among some miscellaneous users.

Boston—Sheet buying is slack with small tank and stove fabricators taking moderate shipments. Miscellaneous demand, met largely by jobbers, has declined although small-lot orders for special finishes are fairly numerous.

Until warehouse distributors seek additional tonnage, the aggregate volume of new business in this territory is expected to be small. There are indications, however, jobbers will buy against last quarter needs within the next few weeks. Some have already covered sparingly. Speculative buying and heavy covering which prevailed at two periods earlier in the year will not develop, in the opinion of sellers.

New York—Some sheet sellers are experiencing perhaps the lightest new business so far this year. Deliveries are showing further improvement and this, with general seasonal influences, is accounting for dullness of new buying, consumers no longer being so concerned about getting on delivery schedules. However, actual consumption is holding unusually well for this season of the year.

Philadelphia—A large automobile body maker has issued releases for several thousand tons of hot and cold-rolled material for preliminary work on 1938 models said to involve Dodge, Plymouth and Studebaker. Additional buying is reported pending for Chevrolet. Heintz Mfg. Co. large stampings manufacturer, is now operating a day shift despite picketing and negotiations are under way for settlement of strike. Miscellaneous demand is still slow although one radio manufacturer is exceptionally busy, especially on automobile radios.

Cincinnati—The bulge in buying of sheets started two weeks ago was modified last week, tonage continuing considerably under mill capacity. Pickup in automotive specifications has been tardier than expected and some interests look to Labor Day as the turning point to much heavier demand.

St. Louis — The sheet situation is showing considerably more than seasonal activity, distributors reporting a fair volume of new business and inquiries from day to day. Miscellaneous demands have revived since the final week in July, and several large consuming groups, including stove and implement makers and railroad equipment builders continue to account for substantial tonnages. Engagements of galvanized by the south for fall delivery are reported the largest for this particular time in a number of years.

Birmingham, Ala.—Demand for steel sheets, including drum stock, has shown a slight falling off in the past week, but with sufficient backlog remaining to assure steady operations for an indefinite period.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Specifications for bolts and nuts generally lack improvement but consumption is sustained at a better rate than usual for this period. This results largely from brisk schedules among tractor and farm implement manufacturers. Operations by freight car builders and railroad shops also are holding well. A steady call for rivets is coming from tank fabricators but operations of structural shops continue rather quiet. Jobbers' specifications still reflect seasonal quiet among miscellaneous users.

Plates

Plate Prices, Page 78

New York—Decision of ship workers at various plants in this district last week to call off their strike, which had been running for a number of weeks, was the outstanding piece of good news in the local plate market. There was a partial resumption at some yards a while ago, but operations were difficult even under police protection and releases came out slowly. Now all of the yards in the district are expected to be in full swing shortly. It is estimated that $30,000,000 of ship work has been tied up here since the trouble began, to say nothing of work that has gone to yards elsewhere and hence lost. New business is still light in general, with deliveries easier all around. On the ordinary widths and gages, consumers have little difficulty in obtaining shipments within two and three weeks.

United Dry Dock Inc., New York, is low on a New York municipal fire boat requiring about 225 tons of steel, principally plates.

Cleveland — Recent requirements have been usually light. This is more pronounced in those mills unable to compete on delivery promises. Mills continue close to capacity with backlogs ranging from four to six weeks. However, operations may be curtailed within the next 30 days as railroad buying is expected to be limited to normal miscellaneous repairs, with little car buying looked for until near the end of the year. Small structural requirements are most active, although demand from industrial sources for floor plate and presses has bolstered the aggregate a considerable extent.

Chicago—Plate shipments continue heavy and more than offset new business despite fair demand from miscellaneous users and tank fabricators. Absence of freight car buying is restricting plate buying in that direction and structural fabricators find no improvement in operations and new business. Plate backlogs still are fairly heavy despite brisk production and will support good schedules during the remainder of this quarter.

Boston—Plate tonnage for specified projects is much heavier. New England shipyards and district navy yards have work for many months, involving more than 8000 tons, mostly plates. The Groton, Conn., yard has placed plates and other steel for two submarines with the Bethlehem, Pa., mill. Boiler shops are booking more tonnage and releases

by structural shops following the recent strike are much heavier. The Holyoke, Mass., pipe fabricator is placing 825 tons for a 48-inch line with an Eastern Pennsylvania interest and a slight flurry in tank work includes 250 tons for the Narragansett Electric Co., Providence, R. I. Deliveries continue to improve, but wide plate shipments are still delayed in some instances.

Philadelphia—Buying of plates is steady at about the rate prevailing for the past two or three weeks, mostly of miscellaneous character. The oil industry is buying moderately and some municipal tank work is in sight, most of which is in the South. Inquiries have been issued by the navy but it is reported only one or two mills can roll the desired material.

Birmingham, Ala.—Continuation of the slight recession noted in plates last week is reported, but order books disclose a heavy backlog upon which mills are glad of an opportunity to make some appreciable inroads.

San Francisco — While awards were few several fair sized lots of plates are up for figures. Metropolitan water district, Los Angeles, has opened bids on two projects calling for 240 tons and 160 tons of 30-inch 10 gage welded steel pipe, Southern Pipe & Casing Co. being low on the latter one. To date this year 29,923 tons have been placed, compared with 98,091 tons for the corresponding period in 1936.

Seattle—Shops report a fair run of small tonnages for tank and boiler jobs, service stations, etc. No large projects are up for figures. Puget Sound Machinery Depot has the contract to fabricate three digesters and an accumulator 600 tons for the Puget Sound Pulp & Timber Co., Bellingham, Wash. This will be undertaken after October when the plant expects to finish fabricating 8000 tons for the Everett, Wash., pipe line.

Vancouver, B. C.—The minister of national defense, Ian Mackenzie, has announced that construction of two mine sweepers to cost $352,000 each will begin shortly. Contract for one has been awarded to the Burrard Drydock Co., North Vancouver, B. C., and the other to Yarrows Ltd., Esquimalt, B. C. Steel tonnages involved are not stated.

Plate Contracts Placed

825 tons, 48-inch steel pipe, Mystic river, Medford, Mass., Metropolitan District Commission project, to Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.; V. Barletta Co., Roslindale, Mass., general contractor.

350 tons, tanks, Barrett Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, two fuel tanks, Narragansett Electric Co., Providence, R. I., to Chicago Bridge & Iron Works, Chicago.

165 tons, 500,000-gallon elevated tank, Tennessee, to Chicago Bridge & Iron Works, Chicago.

150 tons, 500,000-gallon tank and tower, Ottawa, Ill., to Graver Tank & Mfg. Co. Inc., East Chicago, Ind.

125 tons, 24,000-barrel tank, Pasadena, Calif., to Western Pipe & Steel Co., Los Angeles.

Plate Contracts Pending

1040 tons, drydock, Mare Island, Calif., Geo. Pollock Co., San Francisco, low on general contract.

250 tons, 300,000 to 500,000-gallon tank, Pasco, Wash.; bids opened.

133 tons, 20 oil tanks, 3000 to 7050-gallons, metropolitan water district, Los Angeles; Southwest Welding & Manufacturing Co., Alhambra, Calif., low.

100 tons, Richmond-Sunset sewage treatment plant, San Francisco; bids opened.

100 tons, 300-horsepower boiler, state hospital, Talmadge, Calif.; bids Sept. 7.

Strip

Strip Prices, Page 79

Pittsburgh—The strip trade still is experiencing a between-seasons lull in new buying, while auto partsmakers plan new model campaign. Hot-rolled strip is in greater demand than cold-rolled. However, the placing of considerable miscellaneous tonnages for cold-rolled material from 12-inch down is keeping mills fairly busy.

Cleveland — Backlogs in most mills, on both hot and cold-rolled strip, have reached the low point of the year with demand considerably curtailed as a result of marked recession in activity from automotive sources. However, miscellaneous requirements from electrical equipment, small farm tools, and hardware manufacturers have held up better than anticipated despite seasonal influences. It is hoped that renewed buying from automotive sources will materialize before mills are forced to curtail operations.

Chicago—Strip producers have yet to match new business with shipments but an upturn next month is expected. Automotive orders are counted on for improvement within the next two to three weeks while a seasonal pickup in miscellaneous use also is looked for. With backlogs only moderate, relatively prompt shipment can be made on new business.

New York—Incoming strip tonnage lags and new buying trails considerably behind wire. Purchases, however, cover broad range with specialties outstanding. The aggregate volume of such business is fair. Heavy stocks of hot strip held by rollers has curtailed new demand but some uses apparently are about ready to buy again in volume. Deliveries are prompt with backlogs smaller.

Boston—The spotty improvement in new buying of narrow cold strip has failed to hold and a lull in incoming volume followed the flurry. Several of the larger consuming industries, notably manufacturers of builders' hardware, are releasing little steel. A few tonnage orders are being booked, but the general trend is uneven.

Philadelphia—Little increase in demand is noted in demand for hot or cold-rolled strip in narrow widths. Slitting of cold-rolled sheets has cut into the narrow strip business. Prices are steady.

Bars

Bar Prices, Page 78

Cleveland — Requirements for commercial carbon steel bars continue to reflect the seasonal decline in most industries. This is particularly apparent in demand from auto partsmakers, although almost the opposite is true from agricultural sources. Most mills are now able to make deliveries within three weeks, as shipments exceed specifications. Some automotive buying for 1938 models has materialized although not to the extent expected within another two weeks.

Chicago—In the absence of active automotive demand, new business in steel bars still is higher than shipments. Producers anticipate heavier resumption of automotive purchasing before the middle of September and active demand from implement and tractor builders for an indefinite period appears assured. The tractor industry, despite the use of extra shifts, still is behind on orders and attempts are being made to enlarge capacity. Bar deliveries are improving but fairly heavy production is in prospect for the balance of this quarter.

Boston—Commercial steel bar buying is at the low point of the year. Forging and alloy bar demand is also down slightly, but continues relatively higher than for soft steel stock. Bolt and nut activity is slower. New individual orders usually are for small tonnage. Shipyard demand is promising.

New York—Commercial bar deliveries are still easily available within two weeks on a good variety of specifications. New orders are still sluggish, but with a general increase in steel buying expected to set in next month, bars are expected to benefit. Prices are steady.

Philadelphia—Steel demand in general is holding fairly close to the level of the past two weeks,

which is taken to indicate the bottom has been reached and the next change will be upward. The industry is expecting considerably improved business for fourth quarter and it is believed larger backlogs will be built up again. Bar demand is at a minimum and deliveries of two weeks are generally available. Forging shops are fairly active. Increased demand through warehouses is anticipated but has not yet developed.

Baltimore—Commercial bar tonnage is light, with light specifications from railroads. Mt. Clare shops of the Baltimore & Ohio are operating on a light schedule, which is expected to continue until after Labor Day. Deliveries are easy.

Birmingham, Ala. — Bars, along with most grades of finished steel, have been somewhat less in demand during the past week or 10 days. Fall demand, however, from plow manufacturers, is expected to cause a resumption of buying before the end of the month, or certainly not later than early October.

Pipe

Pipe Prices, Page 79

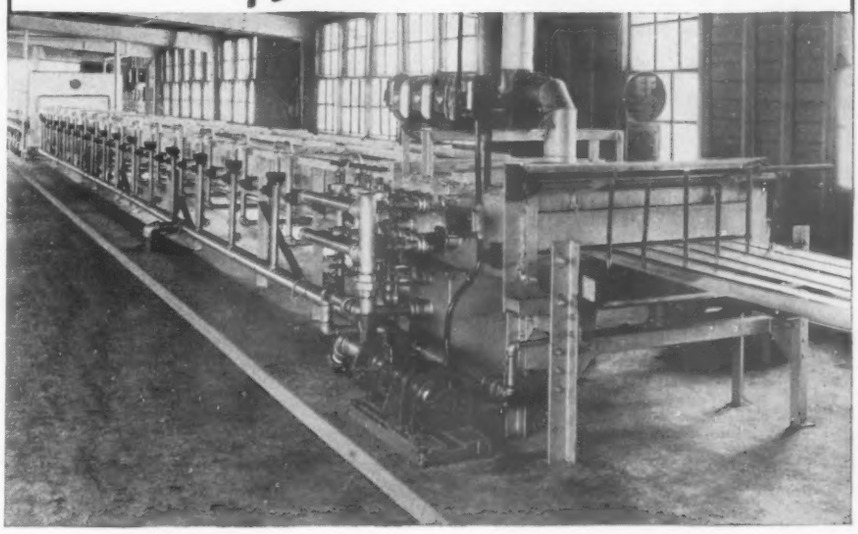
Cleveland — Distributors report stock turnover has held up well in comparison with July, while some look for considerable improvement through the next few months. W. M. Pattison Supply Co., Cleveland, received the initial order of steel pipe for the Industrial Rayon Co's. plant, Painesville, O. While as yet no definite announcement has been made, prices for steel and cast pipe are expected to remain unchanged for fourth quarter.

Boston—Strong pressure has been brought against award of 750 tons, 6 to 12-inch, cast pipe to French interests by contractor for installation at Buzzards Bay, Mass. Domestic sellers claim foreign pipe was bought at prices at least as high as those offered by eastern foundries and one seller offered to meet any outside quotation. The protest has been taken to the citizens of the Cape Cod district, although no federal money is involved. Small orders for cast pipe are more numerous with releases against contracts well sustained. Buying by utilities has been light, but includes 30,000 feet, 4-inch, for the Newport, R. I., Gas Co. Merchant steel pipe sales to consumers are light, but resellers are beginning to release fill-in replacements for stock.

Birmingham, Ala.—Cast iron pipe plants are operating at around 60 per cent of capacity. Spot business is scattered and for small tonnages.

INSULATED FOR

added efficiency and economy with Armstrong's Brick



The Electric Furnace Company of Salem, Ohio Used Armstrong's* A-25, N-16, *and* EF-22 *Insulating Fire Brick in This Modern Annealing Furnace

ABOVE is shown the discharge end of a continuous controlled atmosphere furnace for bright annealing cold rolled steel. It was insulated with Armstrong's A-25, N-16, and EF-22 Insulating Fire Brick for the following important reasons:

1. Greater heating saving.
2. Thinner furnace walls and consequent larger hearth area.
3. More uniform heat distribution.
4. Easier and more flexible temperature control.
5. Quicker heating and cooling of the furnace.
6. Increased production.

Armstrong's Line of Insulating Fire Brick includes five types to meet a variety of needs. They are equally serviceable for electrically heated or coal or gas fired equipment. If you need special shapes, Armstrong can supply them either machined or molded to size. And Armstrong's qualified high temperature insulation engineers are at your service, without charge or obligation, to help you select proper materials for your particular needs.

It will pay you to get the complete story on Armstrong's High Temperature Products. For samples and descriptive literature, write Armstrong Cork Products Company, Building Materials Division, 985 Concord St., Lancaster, Pa.

Armstrong's

HIGH TEMPERATURE INSULATION

No particular pressure is being exerted for immediate delivery.

San Francisco—The fifth largest cast iron pipe award of the year has just been placed by the East Bay municipal utility district, Oakland, Calif., United States Pipe & Foundry Co. securing 900 tons and American Cast Iron Pipe Co., 160 tons of 4 to 20-inch pipe. So far this year 19,917 tons have been booked, compared with 44,453 tons for the same period last year.

Seattle—Buying continues at low levels. Insufficient financing is restricting projects of small municipalities. No large tonnages are up for figures.

Cast Pipe Placed

1060 tons, 4 to 20-inch, East Bay municipal utility district, Oakland, Calif.; allocated as follows: 900 tons to United States Pipe & Foundry Co., Burlington, N. J. and 160 tons to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, 20-inch pipe and fittings, Meadow Park, Queens, New York, to Donaldson Iron Works, Emaus, Pa., through Disalvo Construction Co., New York.

Cast Pipe Pending

1823 tons, 6 to 8-inch, specification X104, Los Angeles; bids Aug. 26.

305 tons, 4 and 6-inch, specification X105, Los Angeles; bids Aug. 26.

110 tons, 6-inch, procurement division, treasury department, New Orleans; Dixie Mill Supply Co., New Orleans, low.

Transportation

Track Material Prices, Page 79

Railroads are attempting to economize on operating expenses in order to offset actual and prospective wage increases, and this program, it is feared, will tend to restrict equipment buying. Few large inquiries for freight cars or locomotives are pending and equipment builders and steel producers anticipate the receipt of few orders until late this year. Shipments of bars, plates and shapes against contracts remain fairly heavy but such backlogs are receding rapidly. Rail buying is expected to be quiet until late this year when purchases are made for 1938 requirements.

Orders for railroad material in the past seven months are far ahead of last year and exceed any 12-month period from 1931 to 1933. Expenditures for railroad maintenance-of-way now are at the highest level in seven years.

New York board of transportation has placed 100 subway cars with American Car & Foundry Co., New York, and Pullman-Standard Car Mfg. Co., Chicago, which were low on a joint bid.

Car Orders Placed

Baltimore Transit Co., Baltimore, 22 trackless trolley cars, 12 to Mack International Motor Truck Corp., New York, and 10 to J. G.. Brill Corp., Philadelphia.

New York Board of Transportation, 100 subway cars, placed jointly with the American Car & Foundry Co., New York, and the Pullman-Standard Car Mfg. Co., Chicago.

Sun Oil Co., 25 tank car tanks to be fabricated by fusion welding process, to the General American Transportation Corp., Chicago; this order has just been authorized by the Interstate Commerce commission with the equipment for experimental service.

Texas & Pacific, 500 box cars to the Pullman-Standard Car Mfg. Co., Chicago, with another 500 reported under option with this company, and 100 hopper cars, to the Bethlehem Steel Co., for construction at Johnstown, Pa.

Utah Copper Co., fifteen 30-yard dump cars, to Austin-Western Road Machinery Corp., Chicago.

Locomotives Placed

Dominion Steel & Coal Co., one 0-4-0 type locomotive, to the Montreal Locomotive Works, Montreal.

Jones & Laughlin Steel Corp., one 0-4-0 type locomotive, to the American Locomotive Co., New York.

Northern Pacific, one rotary snow plow, to the American Locomotive Co., New York.

United Fruit Co., one 200-horse power diesel-electric locomotive for service in Panama, to the American Locomotive Co., New York.

Buses Booked

A. C. F. Motors Co., New York: Thirty 41-passenger for Queens-Nassau Transit Lines Inc., Woodside, N. Y.; twenty 40-passenger for Chicago & Calumet District Transit Co., Hammond, Ind.; twelve 35-passenger for Harrisburg Railways Co., Harrisburg, Pa.; ten 40-passenger for Boston Elevated Railway, Boston; ten 41-passenger for Eastern Massachusetts Street Railway Co., Boston; five 39-passenger for Worcester Street Railway Co., Worcester, Mass.; two 41-passenger for Capital Transit Co., Washington.

Twin Coach Co., Kent, O.: Twenty-two 23-passenger for Springfield Gas & Electric Co., Springfield, Mo.; ten 23-passenger for Baltimore Transit Co., Baltimore; eight 30-passenger for Central Illinois Electric & Gas Co., Rockford, Ill.; six 31-passenger for Canton City Lines Inc., Canton, O.; six 23-passenger for Springfield Transportation Co., Springfield, Ill.; five 23-passenger for New York State Railway, Utica, N. Y.; five 31-passenger for Virginia Electric & Power Co., Richmond, Va.; four 30-passenger for Tennessee Public Service Co., Knoxville, Tenn.; four 30-passenger for Peoples Transportation Corp., Muskegon, Mich.; four 31-passenger for Wheeling Public Service Co., Wheeling, W. Va.

Semifinished

Semifinished Prices, Page 79

Marked improvement in the volume of new orders is being noted by mills and it is expected that this improvement will continue to be supplemented by attractive tonnages for export a little later.

Wire

Wire Prices, Page 79

Boston—Slightly heavier buying by consumers connected with the automotive industry has lifted the volume of incoming wire business nearer to the tonnage of shipments. While still irregular the improvement noted by some producers 10 days ago is maintained. Shipments and sales by several mills are ahead of July with backlogs reduced. Specialties are moderately active. Supplies of rods are freer and several district mills are making substantial headway in building stocks of ingots and billets, open hearth operations in most instances being heavier than finishing mill production. One producer in the district has built up stocks of raw and semifinished steel to a point where open hearth schedules have been sharply reduced. For an aerial tramway on Cannon Mountain, Franconia Notch, N. H., all but two bidders withdrew. American Steel & Wire Co., Worcester, Mass., and John A. Roebling's Sons Co., Trenton, N. J., submitted tenders, the project to cost about $250,000.

Pittsburgh — Continuing to run along on old orders, bar mills here have sufficient for several weeks' work ahead. By Labor Day they expect to receive more business with prospects promising for the autumn. Resumption of automobile building, added to current demand from agriculture implement, refrigerator and nut and bolt rivet makers is expected to keep mills going at almost capacity well toward winter.

Cleveland — Demand for manufacturing wire continues to resist seasonal influences fairly well as requirements from bolt and nut manufacturers and other miscellaneous industrial users remain active. Agricultural demand, while showing some decline, still remains ahead of a year ago. Shipments continue to go into immediate consumption with little forward buying reported.

Chicago—Moderate improvement in steel wire demand this month is viewed as the forerunner of an accelerated pickup in September when automotive buying will be more pronounced. Consumers have made sharp reductions in stocks accumulated earlier in the year, and the necessity for renewed purchasing has been reflected in recent order gains. Jobbers are optimistic regarding prospects for sales of wire products to farmers in view of the good crop outlook. Light backlogs permit early delivery of most wire items.

New York—Moderate gain in wire

orders covers broad range with indications some consumers soon will resume buying in volume. This appears likely with bolt, nut and machine screw producers and chainmakers. Several out of the market for several weeks while working off stocks already have specified heavier tonage. Five hundred eighty tons cable strand for Thousand Islands bridge over St. Lawrence river near Wells, N. Y., will be made at Trenton, N. J., works, American Steel & Wire Co.

Baltimore—Brisk business is noted in several lines, particularly in cable both electric and wire rope. Spring wire specifications again are coming out more freely from mattress manufacturers, and staples are moving in good volume for baskets and packing cases. Pipe mesh is in fair demand. Fencing and agricultural wire in general is seasonally quiet, with little improvement anticipated before Fall.

Shapes

Structural Shape Prices, Page 78

New York—Bids on the Canal-Duane street section, west side elevated highway superstructure, closing Sept. 2 and taking 7503 tons, features new inquiry. The Duane-Cedar street section, taking several thousand tons additional is expected out shortly. Except for this tonnage, new inquiry is lighter and contracts for a few large projects, including 4000 tons for bridges, about maintains new tonnage placed with fabricators.

Boston—Bridge contracts total close to 1800 tons. Most New England states have new bridge work out taking substantial tonnage, an 800-ton structure about to be bid for Bridgewater, N. H. More tonnage is also being released following the settlement of the structural shop strikes in the Boston district. Industrial plant expansion tend to increase and Lever Bros., Cambridge, Mass., and Northeastern university, Boston, have buildings active, taking 1500 tons.

Philadelphia—Mill order books are relatively slim, with at least one mill reported able to clean up present business within a week. Another mill continues to run only three days a week. Most jobs now being figured average less than 100 tons and aggregate volume is light. Mill prices are steady, but close figuring is reported on erection jobs.

Pittsburgh — New structural steel tonnage is being placed sparingly but shape mills continue operating at fair rates on old business. Heavy structurals are in much less demand than the lighter shapes which are moving in scattered lots to individual jobs. Few new projects are up for figures.

Cleveland — The highlight of the structural market last week was the 600 ton award to Bethlehem Steel Co. for the Lorain avenue bridge, Cleveland, through C. B. Moon Co., Cleveland. This includes over 100 tons of plates. A new Main

Shape Awards Compared

	Tons
Week ended Aug. 21	24,660
Week ended Aug. 14	23,454
Week ended Aug. 7	13,213
This week, 1936	31,418
Weekly average, 1936	16,332
Weekly average, 1937	25,834
Weekly average, July	23,384
Total to date, 1936	775,896
Total to date, 1937	878,361

Includes awards of 100 tons or more.

• *Glass* ON DISPLAY •

● Owens-Illinois Glass Company at the 1937 Great Lakes Exposition, feature their numerous products made from glass in a setting designed and built by BECK & WALL.

In this setting that personifies quality,—even the smallest item receives ample publicity. "You must see it,—to know it". That is the basic logic back of good display design.

BECK & WALL through more than nineteen years experience can build into your displays, whether fixed or traveling, a visible sales force that will bring results. Let us work with you in creating displays that will tell your sales story so "he who runs may read"

BECK and WALL • DISPLAYS

1800 EAST 30TH STREET
CLEVELAND OHIO

street bridge, materialized recently with an appropriation of $2,000,000 from the federal government. The remaining $4,000,000, required for the project, is expected to be raised through a local bond issue already authorized.

Chicago—Fabricated awards and inquiries are light. Outstanding items of new projects being 3000 tons for buildings at Milwaukee and La-Crosse, Wis., for Allis-Chalmers Mfg. Co. Smaller jobs are fairly numerous, but total tonnage is only moderate.

St. Louis—While new business consists chiefly of small jobs with relatively small aggregate, fabricating yards are operating at about 75 per cent of capacity, working off orders held up by the strike earlier in the year.

..**New Orleans**—Award of contracts for the substructure and superstructure, approaches, Mississippi river bridge, state project 2606, Baton Rouge, La., includes 11,500 tons of structural steel, 6500 tons carbon and 5000 tons silicon steel for the superstructure, the contract going to Steel Construction Co., Birmingham, Ala., at $1,634,563.40. This job also takes 475 tons, reinforcing 475 tons, rails, and 160 tons, fastening. The substructure for approaches will be done by Uvalde Construction Co., Uvalde, Tex., taking 250 tons of bars at $598,320.40. Contracts were placed by Harry B. Henderlite, state highway engineer. The bridge superstructure, taking 19,250 tons was awarded in June to Bethlehem Steel Co., Bethlehem, Pa.

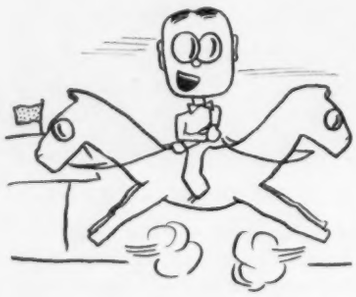
San Francisco — Few structural awards were reported and aggregated only 1392 tons, bringing the total for the year to 117,841 tons compared with 126,365 tons in 1936. Interest centers around the opening of bids on the Mare Island, Calif., drydock on which Geo. Pollock Co., San Francisco, was low. Depending upon which alternate the award will be made, from 1500 to as high as 8000 tons of shapes and sheet piling will be required. Pending business now totals close to 11,000 tons.

Seattle — Bids have been opened at Bonneville, Oreg. for 600 tons involved in gates, stoplogs, etc. but the figures have not been segregated yet. Lakeside Bridge & Steel Co., Milwaukee, appears to be low at $57,740 for trash racks and other equipment, for the same project, involving 385 tons.

Behind the Scenes with STEEL

Horsey

IN LAST week's book, countless thousands of you saw the little note that Whitey Maurath inserted in his ad on page 67. Monday morning most all of you found the book on your desk, and by Tuesday special trucks were speeding out to Whitey's place filled with letters giving your ideas on what was wrong with the picture. All through the week they continued to pour in, according to Whitey, in basketfulls. He found many things wrong with his picture, including among others that he was holding his finger over the end of the binoculars and thus couldn't see the races; that the flag should have been the Union Jack instead of the Stars and Stripes, and that the judges' stand was at the wrong end of the grandstand. We sent in our guess



along with all the rest, but so far we have failed to receive anything and Whitey steadfastly refuses to tell us the real answer, so we are going out to the races ourselves and check up. We're afraid our answer was left *hors de propos.*

* * *

Sexcellent

SEEMS that this department was not alone in its admiration of the bathing beauty cover on the June 14 issue. Comes to our desk a copy of *The Triple E*, house organ of Eclipse Electrotype & Engraving Co., saying that cover is an excellent example of how to advertise a product by advertising something else. Gives a full page reproduction of the cover in color, and the gal looks just as sweet as ever. "Human interest in illustration," it seems, is the technical lingo for what we know as "sex in advertising". H'mmm. Chalk one up for the engraving boys.

* * *

Four Skis

NOT that it makes any great difference to you, but we are glad to pass along the information that there is a firm of attorneys headquartered at 3115 Barlum Tower, Detroit, by the name of Koscinski, Kaminski, Poleski & Wojcinski who would be glad to take care of any delicate legal matters for you.

We haven't investigated, but probably their office door carries nothing beyond the cryptic lettering: K, K, P. & W., Attys.

* * *

Poesy

WELL, sir, we thought we had the R. S. dept. stopped last week, but now comes the following from their poet lowrate.

To Shrdlu, from the Readers' Service Department, in re BTS August 16:

We sat and looked upon the doorhinge
And said "At last a word to rhyme with orange"
Then the door blew shut with a loud slambamck
And we thought of a rhyme for the word Hamtramck
So the R. S. department will never say die
Though our answers aren't perfect, we sure as hell try.

* * *

Errata

CONTRARY to public opinion, editors of STEEL are human and are prone to make errors. Last week Cinderella of the Steel Mills had her captions slightly jumbled, so on pages 44 and 45 of this week's book restitution is made so all you good people who were wondering who made what pits and why the controls didn't look familiar can set yourselves aright. This little service, prepared by STEEL'S editorial department, comes to you free of charge with the compliments of the management.

—SHRDLU

Shape Contracts Placed

5000 tons, plant, General Motors Corp., Trenton, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; John McShain general contractor.

4600 tons, piling, regulating and grading beach channel drive, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through A. M. Hazel Inc., New York, general contractor.

2500 tons, approaches, International bridge, Port Huron, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

1061 tons, grade crossing elimination, Hartford-Williamantic turnpike, Windham, Conn., includes 406 tons, structurals, to American Bridge Co., Pittsburgh, and 555 tons steel bearing piles and 100 tons sheet piling to Carnegie-Illinois Steel Co., Pittsburgh; through M. A. Gammino Construction Co., Providence, R. I.

800 tons, state bridges, various locations, Massachusetts, to Bethlehem Steel Co., Bethlehem, Pa., bulk of tonnage included in openings of July 6 and June 29.

740 tons, plant, Douglas Aircraft Co., Santa Monica, Calif., to Western Pipe & Steel Co., Los Angeles.

550 tons, Lorain avenue bridge, Cleveland, to Bethlehem Steel Co., Bethlehm, Pa. C. B. Moon Co., Cleveland, general contractor.

525 tons, Groewing building, Coxsackie, N. Y., to Leach Steel Co., Rochester, N. Y.

460 tons, state bridge, contract No. 1560, Shelbyville, Ind., to Central States Bridge & Steel Co., Indianapolis.

450 tons, bridge, Lincoln county, Georgia, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; Cornell-Young Co., Macon, Ga., general contractor.

450 tons, First Stone river bridge, Seaboard Air Line Railway, Stono, N. C.,

to Bethlehem Steel Co., Bethlehem, Pa.

390 tons, bridge, Alexander avenue, Bronx, N. Y., to American Bridge Co., Pittsburgh.

360 tons, foundry extension No. 2, American Locomotive Co., Schenectady, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, addition to Metal Storage building, Fisher Body division of General Motors Corp., Grand Rapids, Mich., to Jones & Laughlin Steel Corp., Pittsburgh.

330 tons, state highway bridge, No. 3839, Washington county, New York, to Phoenix Bridge Co., New York.

325 tons, addition, Frankfort distillery plant, Louisville, Ky., to International Steel Co., Evansville, Ind.

320 tons, crane runway and alterations, Plymouth, N. C., to Ingalls Iron Works, Birmingham, Ala.

320 tons, intercounty bridge, Kenilworth, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, Taftville state bridge, Lisbon, Conn., to Harris Structural Steel Co., New York.

300 tons, factory building, McGraw Electric Co., Elgin, Ill., to Mississippi Valley Structural Steel Co., Chicago.

290 tons, addition, Alexian hotel, Signal Mountain, Tenn., to International Steel Co., Evansville, Ind.

286 tons, trash racks, etc., Imperial dam, Calif., to unnamed interest.

270 tons, highway project FAP-258-C, Sumter county, Alabama, to Virginia Bridge Co., Roanoke, Va.

250 tons, 20,000 feet, steel curbing, New York, to Eggleston Bros. & Co., Long Island City, N. Y.

230 tons, Hamilton avenue bridge, Flint, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

220 tons, store and office building, Lexington avenue and Eighty-seventh street, New York, to Schact Steel Construction Co., New York.

219 tons, state bridges, North river, Charlemont, Shelburne and Colrain, Mass., WPFR 6 and WPFR 5, to the Boston Bridge Works Inc., Cambridge, Mass.; Charles I. Hosmer Inc., Greenfield, Mass., general contractor.

215 tons, factory addition, City Auto Stamping Co., Toledo, O., to Whitehead & Kales Co., Detroit.

210 tons, warehouse addition, Port Everglades, Fla., to Tampa Shipbuilding & Engineering Co., Tampa, Fla.

200 tons, school, Immaculate Conception parish, Jamaica, New York, to Dreier Structural Steel Co., New York

200 tons, additional bridge work, Lycoming county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

188 tons, bridge, Fremont county, Colorado, to unnamed interest.

185 tons, crane runway, Syracuse, N. Y., to Ingalls Iron Works, Birmingham, Ala.

175 tons, state bridge, Ware river, Palmer, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; B. A. Gardetto Inc., Boston, general contractor.

165 tons, state highway bridge, Northern State parkwork (Glen Cove road separation) NSP 37-5, Nassau county, New York, to American Bridge Co., Pittsburgh; William J. Vanderwater, Flushing, N. Y., general contractor, bids Aug. 3.

164 tons, grade crossing over Pennsylvania railrooad, state project, Deans road, North Brunswick, N. J., to Morris-Wheeler & Co. Inc., Philadelphia, bids July 26.

135 tons, crane runway alterations, Ottawa, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

135 tons, building addition, Servel Inc., Evansville, Ind., to International Steel Co., Evansville.

130 tons, piling, substructure bridge, North Kennebunkport, Me., to Carnegie-Illinois Steel Co., Pittsburgh; through Concrete Construction Co., Chelsea, Mass.

125 tons, theater, Amherst college, Amherst, Mass., to New England Structural Co., Everett, Mass.

122 tons, bulk head gates, Grand Coulee dam, Wash., to unnamed interest.

110 tons, storage warehouse, Manhasset, L. I., to Dreier Iron Works, Bronx, N. Y.

105 tons, factory addition, New Albany, Ind., to Snead Architectural Iron Works, Louisville, Ky.

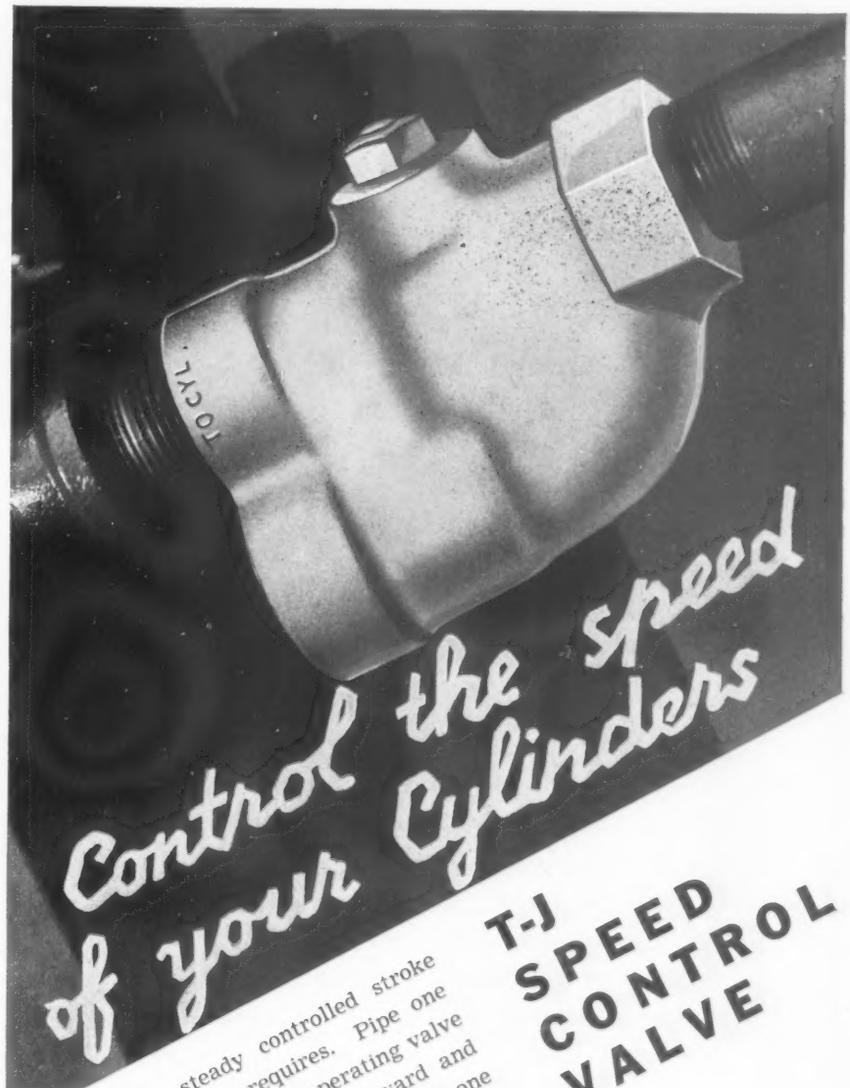
100 tons, shapes and bars, state highway project, including 84-foot span I-beam bridge, Lyndon, Vt., to Vermont Structural Steel Co., Burlington, Vt., and Albany Steel & Iron Supply Co., Albany, N. Y.; H. G. Calkins, Danville, Vt., general contractor.

100 tons, state highway project FAS-SS-37-12, Tioga county, New York, to Lackawanna Steel Construction Co., Buffalo, N. Y.; Binghamton Construction Co. Inc., Binghamton, N. Y., general contractor.

Unstated tonnage, highway bridge, Savannah river, Allendale, S. C.-Sylvania, Georgia, to Vincennes Bridge Corp., Vincennes, Ind.; bid Aug. 10.

Shape Contracts Pending

7503 tons, including 7210 tons, structural carbon steel, and 293 tons, silicon structural steel, superstructure, west side elevated highway with ramp,



EFFECT the steady controlled stroke that your installation requires. Pipe one of these in the line from the operating valve to the cylinder, or if both the forward and reverse strokes are to be controlled, pipe one in the line to both ends of the cylinder. These valves are available in ¼", ⅜", ½", ¾", and 1" I.P.S.

T-J SPEED CONTROL VALVE

write for Bulletin

THE TOMKINS-JOHNSON CO.

611 N. Mechanic Street
Jackson, Michigan

West and Marginal streets, from Canal to Duane streets, New York; bids Sept. 2, president, borough of Manhattan, New York. Contract also includes 100 tons of cast steel and 212 tons cast iron.

3000 tons, building, Allis-Chalmers Mfg. Co.; 2000 tons at LaCrosse, Wis., 1000 tons at Milwaukee.

1500 to 8000 tons, including sheet piling, drydock, Mare Island, Calif.; Geo. Pollock Co., San Francisco, low at $2,636,975.

1200 tons, power house, Edison Electric Illuminating Co., Boston; Thomas O'Connor Co., Boston, general contractor.

1200 tons, addition to factory building, Libbey Owens Glass Co., Toledo, O.

825 tons, state bridge, Bridgewater, N. H.; bids soon.

800 tons, building, Lever Bros., Cambridge, Mass.

650 tons, engineering building, Northeastern University, Boston; bids Aug. 31.

395 tons, trash racks, etc., for Bonneville dam; Lakeside Bridge & Steel Co., Milwaukee, apparently low.

350 tons, Bascule lift span and repairs, Fall River, Mass., for state of Massachusetts.

330 tons, high school building, board of education, Vestal, N. Y.

300 tons, grade separation bridge, Howell, Mich., for state of Michigan.

300 tons, pressed glass building, General Electric Co., Niles, O.

270 tons, C. & O. Overhead, Russell, Ky., state of Kentucky.

250 tons, service building, Westinghouse Electric & Mfg. Co., South Boston, Mass.

235 tons, procurement division, treasury department, New York; bids in.

230 tons, bridge, Central R. R. of New Jersey, Elizabeth, N. J.

230 tons, miscellaneous material, Thirty-third street and First avenue, U. S. Treasury department, Brooklyn, N. Y.

225 tons, U. S. route No. 1, Big Pee Dee river, Cheraw, S. C.; bids Sept. 21.

200 tons, state bridges, Pittsfield and Adams, Mass.; bids Aug. 24, department of public works, Boston, G. H. Delano chief engineer.

200 tons, Union avenue, Portland, Oreg., state bridge; Averill & Corbett, Portland, low.

200 tons, garage, department of sanitation, Bergens Landing, Queens, N. Y.; bids Sept. 3.

200 tons, bridge, Eagle River, Wis.; bids Aug. 27.

180 tons, state bridge, South Main street over Millers river, Orange, Mass.; Charles I. Hosmer Inc., Greenfield, Mass., low, $71,435.10, bids Aug. 17, department of public works, Boston, G. H. Delano chief engineer.

150 tons, grade separation, Marquette county, Michigan; bids in.

132 tons, I-beam overpass, route U. S. 5, Newbury, Vt.; Ryan & Densmore, Claremont, N. H., general contractor; also takes 68 tons reinforcing bars.

130 tons, building, Brown University, Providence, R. I.

125 tons, state bridge, Farmington, Me.; bids Aug. 25.

110 tons, telephone exchange addition, Lowell, Mass.

100 tons, steel piling, cofferdam, Mystic river, Medford, Mass., Metropolitan district commission project; M. McDonough, Saugus, Mass., low.

100 tons, highway bridge, Center county, Pennsylvania; bids Aug. 27.

CROSBY FOR STAMPINGS

ALL our efforts have been concentrated on one product—STAMPINGS—for 40 years. We have made stampings, deep, intricate, heavy, light, large and small, for nearly every branch of industry.

Stamping Specialists Since 1896

An Experience You Should Not Overlook
Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

Reinforcing

Reinforcing Bar Prices, Page 79

Pittsburgh — Small lot business locally is supplementing the reinforcing bar specifications still on mill books. Largely these lots are being delivered by truck and as they repeat frequently they aggregate a fair weekly tonnage. As the road-building and building construction season approaches its end for this year reinforcing bar sales are expected to expand in the ensuing month or six weeks.

Cleveland — Estimated tonnage of reinforcing steel bars from private sources during July for northern Ohio was 458 tons, compared with 2270 tons in June and 385 tons in May. The heavy June tonnage resulted from 1900 tons for the Industrial Rayon Co's new plant at Painesville, O. Market continues relatively inactive with mills able to make deliveries within a few days. Recent awards and pending projects are limited to small lots requiring less than 50 tons.

Chicago—Shipments are in excess of new business and deliveries have improved with the decline in backlogs. New projects generally are small but jobs involving less than 100 tons are fairly numerous. Except for occasional small inquiries for state road and bridge work, public construction is accounting for only a limited business.

Boston—Reinforcing steel buying, including highway mesh, is heavier. Approximately 2000 tons has been awarded, nearly half this tonnage being for bridge and road needs in Connecticut. The Coolidge memorial bridge, Northampton, Mass., due for bids shortly, takes 800 tons. Small-lot covering is active. Prices are frequently shaded on the more attractive offerings.

New York—Current contracts approximating 4000 tons have reduced active tonnage pending as buying has been well ahead of new inquiry. New work includes close to 500 tons

Concrete Awards Compared

	Tons
Week ended Aug. 21	14,094
Week ended Aug 14	14,116
Week ended Aug. 7	7,310
This week, 1936	7,720
Weekly average, 1936	6,005
Weekly average, 1937	6,349
Weekly average, July	6,919
Total to date, 1936	242,893
Total to date, 1937	215,893

Includes awards of 100 tons or more.

for another section of the West side elevated highway, while close to 1300 tons remains to be placed for a bullion depository, West Point, N. Y. Award of 1600 tons for sewers about completes inquiry for such work, which has been heavy, accounting for 7500 tons, recently.

Philadelphia—Reinforcing bar fabricators are figuring on a few jobs, but these generally involve less than 100 tons and are mostly private. Pennsylvania state institutional program has been approved, but probably will not reach active stage for three or four weeks.

Birmingham, Ala.—A slightly better demand for reinforcing bars has developed, following some recession in buying a few days ago. Backlogs, however, are sufficient to warrant sustained production.

San Francisco — Demand for reinforcing bars has quieted, only 1954 tons being booked, bringing the total to date to 58,758 tons, compared with 165,424 tons a year ago. Largest award went to W. C. Hauck & Co. and called for 290 tons for a plant in San Francisco for the Smith Lithograph Co. No action has yet been taken on 6576 tons for United States Engineer office, Los Angeles.

Seattle — While important tonnages are lacking, local mills report an increase in small orders, the aggregate of which has resulted in enlarged mill operations. Merchant bar demand is small. About 500 tons involved in state road projects await subcontract.

Reinforcing Steel Awards

6576 tons, project No. 7, U. S. Engineers office, to Soule Steel Co., Los Angeles.

840 tons, wharf construction, Corpus Christi, Tex., to Alamo Iron Works, San Antonio, Tex.; through A. J. Rife Construction Co., Dallas, Tex.

750 tons, sewer, Queens, N. Y., to Igoe Bros., Newark, N. J.; through Di Salvo Construction Co., Brooklyn, N. Y.

500 tons, mesh and bars, highway section, Merritt parkway, Greenwich, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; A. I. Savin Construction Co., East Hartford, Conn., general contractor.

500 tons, American Safety Razor Corp. factory, Brooklyn, N.. Y., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, building, Kankakee, Ill., General Foods Corp., to Concrete Steel Co., Chicago.

450 tons, sewer, Hempstead, N. Y., to Carroll & McCready Co. Inc., Brookly, N. Y.

350 tons, building, Frigidaire division, General Motors Corp., Moraine City, O., to Bethlehem Steel Co., Bethlehem, Pa.; through Chas. H. Shook Inc., Dayton, general contractors.

350 tons, office & laboratory building, B. B. Chemical Co., Boston, to Joseph T. Ryerson & Sons Inc., Chicago.

300 tons, Back river sewage disposal plant, Eastern avenue extended, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

290 tons, plant, Smith Lithograph Co., San Francisco, to W. H. Hauck & Co., San Francisco.

225 tons, building, National Cash Register Co., Cincinnati, to Cincinnati Builders' Supply Co., through Industrial Building Co., Dayton, contractors.

200 tons, state highway projects, various locations, Massachusetts, to Truscon Steel Co., Youngstown, O., awarded through Charles I. Hosmer Inc., Greenfield, Mass., general contractor.

200 tons, building, New York Central railroad, West Side New York; to Truscon Steel Co., Youngstown, O.; through James Stewart Co., New York.

175 tons, addition to Consolidated Steel Corp., Los Angeles, to Consolidated Steel Corp., Los Angeles.

168 tons, grade crossing, New York, New Haven & Hartford railroad, Newington Junction, Conn., to Truscon Steel Co., Youngstown, O.; Arute Bros. Inc., New Britain, Conn., general contractor.

150 tons, grade crossing elimination, Hartford-Williamantic turnpike, route U. S. 6-A, Windham, Conn., to Concrete Steel Co., New York; M. A. Gammino Construction Co., Providence, R. I., general contractor.

150 tons, H-piles, in addition to 195 tons bars, previously reported, underpass, Juntington avenue, Boston, to Concrete Steel Co., New York; E. M. Matz Co., Boston, general contractor.

150 tons, highway project, Queens, N.

THIRTY-NINE

Brosius two motor electric mechanical clay guns

have been sold during the past three years, twenty-seven in the United States and twelve abroad.

Brosius Electric Guns stop the hole SAFELY and continuously under full wind pressure, producing a more regular operation, a constant gas pressure, and increased production, savings which will pay for the installation in about six months.

No men are required in the danger zone during the plugging operation, a nine cubic foot clay barrel provides ample clay to take care of any emergency, and the hole can be stopped with the iron flowing full.

No clamping mechanism is employed, thus eliminating the delay of clamping the gun before discharging the clay, as with the Brosius gun the clay is discharged the instant the nozzle enters the tapping hole.

Two Hundred Sixty-six Blast Furnaces throughout the world have been equipped with Brosius Automatic Clay Guns.

OTHER PRODUCTS

Steam and Hydro-Electric Clay Guns, Hand and Motor Operated Goggle Valves, Cinder Notch Stoppers, Flue Dust Conditioners, Blast Furnace Slag Granulating Machines, Single Hook Grab Buckets, Automatic Dump Buckets, Automatic Single Hoist Buckets, Overhead and Auto Floor Charging Machines for serving Heating and Melting Furnaces, Auto Floor Manipulators for serving Steam Hammers, Presses, etc.

Edgar E. BROSIUS, Inc.

Engineers and Manufacturers

PITTSBURGH SHARPSBURG BRANCH **PA.**

European Distributor: Dango & Dienenthal, Siegen, Westphalia, Germany

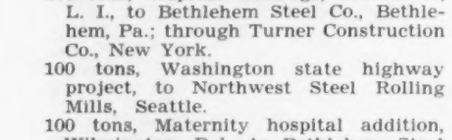
Brosius Equipment is patented in the United States and Foreign Countries

Y., to Concrete Steel Co., New York; through A. W. Banko Inc., Hastings on Hudson, N. Y., general contractor.
150 tons, warehouse, Cohen Realty Co., Wilmington, Del., to American Steel Engineering, Philadelphia.
120 tons, grading and drainage, Queens approach Whitestone bridge, New York, to Jones & Laughlin Steel Corp., Pittsburgh; through Tully & Dinapoli, New York.
100 tons, state highway projects, Fitchburg-Leominster, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; A. G. Tomasello & Son, Boston, general contractor.
100 tons, bridge, Braintree, Mass., to Truscon Steel Co., Youngstown, O.; through M. F. Gaddis, Boston, general contractor.
100 tons, highway project, New Haven, Vt., to Truscon Steel Co., Youngstown, O.; Troy Paving Co., Hudson Falls, N. Y., general contractor.
100 tons, highway project, Wallingford, Vt., to Truscon Steel Co., Youngstown, O.; E. C. Hayden, Barre, Vt., general contractor.
100 tons, hospital buildings, Greedmoor, L. I., to Bethlehem Steel Co., Bethlehem, Pa.; through Turner Construction Co., New York.
100 tons, Washington state highway project, to Northwest Steel Rolling Mills, Seattle.
100 tons, Maternity hospital addition, Wilmington, Del., to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, building, Tabin-Picker & Co., Chicago, to Calumet Steel Co., Chicago.
100 tons, telephone building, Los Angeles, to unnamed interest.
100 tons, bureau of reclamation, invitation 42,738-A, Globe, Ariz., to unnamed interest

Reinforcing Steel Pending

1000 tons, mesh highways, New York state; bids Aug. 17 and 31, Albany, N. Y.
850 tons, Vignes crossing, Los Angeles; Persons & Hollingsworth Co., Los Angeles, low.
775 tons, drydock, Mare Island, Calif.; Geo. Pollock Co., San Francisco, low.
500 tons, silos, General Foods Inc., Kankakee, Ill.
477 tons, superstructure, west side elevated highway, West and Marginal streets, from Canal to Duane streets, New York; bids Sept. 2, president, borough of Manhattan, New York.
450 tons, U. S. route No. 1, Big Pee Dee river, Cheraw, S. C.; bids Sept. 21.
400 tons, upper deck, Henry Hudson bridge, New York, bids to re-advertised.
350 tons, building, Boston Blacking & Chemical Co., Cambridge, Mass., Aberthaw Construction Co., Boston, general contractor.
300 tons, mesh and bars, plant General Motors Corp., Trenton, N. J.
300 tons, Chrysler Motors, Detroit, Mich.
250 tons, flour storage building, Washburn-Crosby Company, Buffalo, N. Y.
240 tons, bureau of reclamation, invitation A-42,314-A, for delivery at Calexico, Calif.; Ceco Steel Products Co. low.
250 tons, Pacific Employers' Insurance Co. building, Los Angeles; bids being taken.
150 tons, officers' quarters, air depot, Sacramento, Calif.; bids Sept. 9.
125 tons, bridges, Central Railroad of New Jersey, Elizabeth, N. J.; bids in.
111 tons, bridge, Mendocino and in Humboldt county, California; bids Sept. 1.
Unstated, Coos county, Oregon, state overcrossing; Mountain States Construction Co., Eugene, low.
Unstated, state underpass, Seasons, Ida.; Clifton & Applegate, Spokane, Wash., low.
Unstated, Oregon state underpass, Ontario; C. J. Montag, Portland, low.

American dustube Dust Collectors . . . . essential for complete dust suppression!



Most of the entries reach the goal, but one gets the flag ahead of the rest — one has more stamina, more efficiency, better co-ordination of mechanism. American dustube Dust Collectors are trophy winners, too — they outclass all entries! — for quick, complete and economical suppression of dust.

American dustube Dust Collectors are widely used in foundries, mills, mines and industrial plants where dust creates a hazard that is health and profit-impairing and conducive to equipment deterioration as well.

dustube Dust Collectors are of advanced design — the result of long experience in making dust arresting equipment. They feature ease of installation, long lasting, cylindrical dustubes that completely trap the dust, a simple, highly efficient tube shaking device, simple installation and removal of tubes, highly efficient operation, and negligible maintenance costs. Motors are totally enclosed, housing is dust-sealed, and the 55° hoppers simplify rapid emptying of collected dust.

American Dust Collector Engineers are available to make a survey of your plant without obligation and will submit recommendations on the size and type of dustube Dust Collector best suited to your needs.

Send for a copy of the American dustube Dust Collector Catalog No. 22.

THE AMERICAN FOUNDRY EQUIPMENT CO.
509 South Byrkit Street, Mishawaka, Ind.

Makers of Abrasive Blast Equipment for every metal cleaning operation — dustube collectors, sand cutters, and other foundry equipments.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh—Important producers of merchant pig iron in this district early in the week opened books at unchanged third quarter prices for all grades for fourth quarter deliveries. Shipments of pig iron continue steady although new business has been slow in appearing. Rumored expectation of a price advance being forced possibly toward the end of the year, presaged by the steady rise in prices of iron and steel scrap, is inducing forehanded pig iron buyers with actual business in sight to find a place immediately on fourth quarter books.

Cleveland — Some impressively large orders were placed with producers as books were opened early last week for fourth quarter, with prices extended. This covers all grades including silvery. Shipments during August have to date held about on a par with July, despite the marked slackening in automotive requirements since the first of the month. General improvement is expected over the next 30 days, now that prices for fourth quarter have been clarified and with the expected resumption in activity among auto foundries.

Chicago—Announcement of extension of the $24 market on No. 2 foundry and malleable, with similar continuations on other grades, into fourth quarter has been followed by a fair volume of new business. While some foundries before the price extension had ordered ahead in anticipation of a possible advance, some users who have estimates of fourth quarter needs are interested in protecting themselves on their requirements, particularly since the possibility of an increase later in the year still is present. Shipments are steady and moderately heavier than a month ago while foundry operations are unchanged or slightly more active. Automotive foundries have yet to swing into heavy production on 1938 model parts.

Boston—Pig iron sellers, including the Everett, Mass., producer, are booking fourth quarter tonnage at reaffirmed prices. While the vol-

ume placed for last quarter delivery is light, the tonnage is increasing.

New York—New business is expected to improve following opening of books for fourth quarter. While prices are being extended, this belief is predicated on the possibility higher prices may be named later in the year. This would follow precedent established on certain previous occasions, one being early this year when price first announced for second quarter was later further increased on all new business.

Opening of books early last week, the middle of the second month preceding a new quarter, comes a week or 10 days earlier than usual.

Some contracting for fourth quarter has been done within the past few days. Actual melt still reflects seasonal influences.

Philadelphia—Opening of books for fourth quarter at unchanged prices has failed to develop interest in covering future requirements. Two or three sellers report moderate orders, however. In general sellers' books are thin and heavier buying is expected in view of the continued excellent rate of shipments to foundries, independent steelworks and pipemakers, previously well covered through fourth quarter. Reports persist that fourth quarter will witness a price increase on an effective immediately basis.

Cincinnati—Fourth quarter tonnage of both northern and southern pig iron is being accepted at unchanged prices. Buying so far has been conservative with no resemblance of a rush to cover. Shipments are off, reflecting lighter schedules on castings for automobiles and machine tools.

St. Louis—District furnace interests have extended prices into fourth quarter. This move was followed by some contract buying for that delivery, mostly small tonnages. Possibility of an advance later is expressed in some quarters. Blast furnaces have fair backlogs and are not especially anxious to augment commitments. Melt has improved during the past week. Stove plants have stepped up operations. Jobbing foundries report spotty conditions and generally are operating three to five days a week.

Birmingham, Ala.—Confirmation of current prices and opening of books for fourth quarter business by Sloss-Sheffield Steel & Iron Co., Republic Steel Corp. and Woodward Iron Co., has been announced here.

Toronto, Ont.—Demand for merchant pig iron is increasing and melters are showing more interest. Sales for the week totaled 1500 tons with demand confined to spot delivery. Furnace representatives expect heavier booking for last quarter. Daily melt is around 65 per cent, with higher average indicated for early September. Current demand runs largely to foundry iron with turnover of 1000 tons for the week. Malleable is spotty moving in lots of 50 to 100 tons, while basic has limited call, chiefly in the Montreal area. Prices continue firm and unchanged.

Scrap

Scrap Prices, Page 82

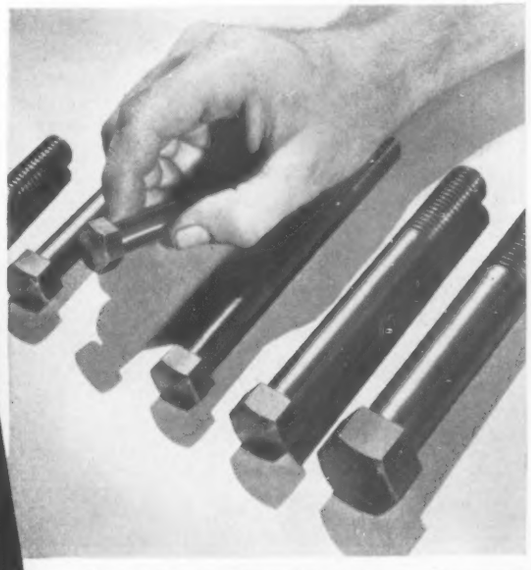
Pittsburgh—Further strength in the iron and steel scrap market is being translated into quotations although the general trade seems a trifle hesitant. One important steel maker here has just placed orders for heavy melting steel, dividing them among several dealers and paying $22.50. Shipments continue steadily and insistent but new buying is being done selectively.

Borings and turnings have advanced 25 to 50 cents a ton. Railroad scrap, such as knuckles, coil and leaf springs, malleable, and steel wheels are higher by half a dollar.

Chicago—Scrap is quiet here but prices are steady and the market still shows underlying strength. New business from mills is lacking and No. 1 heavy melting steel nominally is unchanged on the basis of last consumer purchases at $19.50 to $20. While offerings have increased in some directions, these are insufficient to offset demand.

Boston—Scrap prices continue to advance with heavy melting steel for export stronger and coming out less freely despite higher bids. Within a week approximately 15,000 tons of scrap has been cleared from Boston on three ships, most going to Hull, Eng. Buying against export orders is unabated. Domestic demand is less active, but enough business is being done to hold the market firm, with advances on several grades, including steel car axles, up sharply to $24.00-$25.00, f.o.b. Boston, borings and turnings, forge flashings, scrap rails, mixed shafting and skeleton. Price increases on these grades average close to 50 cents a ton. Heavy melting steel for New England delivery, notably Worcester, is slightly stronger, also for Eastern Pennsylvania, but at present prices paid for dock delivery, the tonnage available is limited.

New York—Several grades of scrap for export are slightly firmer,



Uniformity IS A DETAIL OF PRODUCTION IMPORTANT TO your costs

● Striving to make cap and set screws of constant uniformity in all mechanical and metallurgical details requires unceasing care. It demands specialized skill, modern equipment and—experience. It requires a large investment in time and money to produce a superior product that in turn will reduce your assembly costs. Cleveland Cap Screws meet all these requirements—*every one of them.* In our four warehouses and the factory we stock 30 million pieces, ready to ship any size in any quantity at once. Ask for Catalog E and current Price List. THE CLEVELAND CAP SCREW COMPANY, 2935 East 79th Street, Cleveland, Ohio.

Address the Factory or Our Nearest Warehouse:

CHICAGO, 726 W. Washington Blvd.
PHILADELPHIA . 12th & Olive Sts.
NEW YORK . . . . 47 Murray Street
LOS ANGELES . 1015 East 16th St.

CLEVELAND CAP SCREWS
SET SCREWS • BOLTS AND NUTS

including heavy melting steel, brokers paying 50 cents higher in some instances, with a top of $17.50. Prices for domestic shipment have leveled off with few changes, though rails for rolling are up 50 cents, with $19.50 offered. Most eastern mills are taking steelmaking grade shipments. A fair volume of buying in moderate tonnages is noted. Buying for export continues active though new orders from abroad are not heavy.

Philadelphia—Heavy melting steel continues steady at recently prevailing prices though there has been no new buying of consequence. Mills are displaying a waiting attitude in expectation of a weaker market, which has not developed. Yard stocks are light and little material is coming out. Several steel specialty grades are up further on new business at higher prices. Electric furnace interests have paid as high as $20 for axle turnings although this is not generally reflected in the quoted market. Low phosphorus punchings have brought $25, to which must be added $2 for freight.

Cincinnati—Heavy melting steel and heavy railroad items were advanced 50 cents in this district last week on aggressive bidding for current railroad lists. The market shows no weakness but attitude of dealers indicates a leveling off. Scrap is coming out in increased volume and is readily absorbed.

Detroit—In keeping with the tone of the scrap market in other centers, trade here has quieted for the time being, apparently digesting the increases in prices registered in recent weeks. No important lists have come up for bidding, but the first of the new lists from Chrysler is expected Aug. 25, with others following. Tonnages are surprisingly large in view of the season. Outlook for the next few months is bullish, most dealers anticipating higher price levels when the current easiness is spent.

St. Louis — Purchasing of iron and steel scrap the past ten days or two weeks has been in considerable volume, with east side mills accounting for several thousand tons of heavy melting steel and railroad specialties.

Birmingham, Ala.—Settlement of CIO strikes in three of the larger scrap yards was affected during the week, enabling dealers to resume full operations to meet an insistent demand. Heavy melting, which last week jumped $1 a ton, is still in greatest demand with considerable tonnage being taken by foundries and much of it moving for export shipment.

Seattle—The market continues to mark time, believing that Japan will buy soon. Meanwhile import restrictions and exchange difficulties have practically eliminated both Japan and China as customers.

Toronto, Ont.—Demand for iron and steel scrap continues active. Mills in the Hamilton district are taking delivery of heavy melting steel and turnings against contracts and there also is a good demand on new order account. Local dealers are filling orders out of stock. Other steel grades also are showing action, but automobile scrap is piling up in dealers' yards despite the fact that there have been some big shipments recently to the United States. Machinery cast is in demand and most dealers find difficulty in obtaining supplies for current demand. Stove plate also has a ready call with supplies light, while other lines are spotty. Prices are firm with higher levels in prospect.

Warehouse

Warehouse Prices, Page 81

Cleveland — Tonnage out of warehouse continues to reflect the usual summer recession, although the number of orders has been on a par with July. This decline has not been restricted to individual products, but blankets the whole range of steel products handled through this channel, with the possible exception of plates. Some look for a sharp reversal in present trend within the next 30 days, resulting from expected fall activity.

Chicago — Sales are fairly steady but the trend is gradually downward. While gains continue to be shown compared with a year ago in demand from both the city and country, the latter shows a somewhat larger increase than the former. Floor plates have been reduced 30 cents per 100 pounds to 5.35c. With the exception of small revisions in boiler tube prices, other commodities are unchanged.

New York—Warehouse distributors have lowered prices on floor plates, 3/16" and heavier to 5.60c, a reduction of 30 cents per 100 pounds in line with recent mill adjustments.

Philadelphia—Warehouse business is irregular with some interests reporting further easing in demand and others a volume close to that of July. New quantity schedules were placed in effect last Monday on boiler tubes, in line with mill revisions. Prices show little deviation from quoted schedules.

Baltimore—Jobbing business here has been light since the middle of July, and although it has been possibly a shade more active recently, distributors look for general dullness over the remainder of this month. The recent reduction of $6 in mill price on floor plate may be reflected in warehouse prices here shortly.

St. Louis—Sales from store are showing seasonal influences. Volume so far this month, while under corresponding period in June, is well above a year ago. Demands are fairly well diversified, though sheets hold the center of interest. Purchasing by the general manufacturing trade is at higher levels than usual.

Iron Ore

Iron Ore Prices, Page 82

New York—Manganese ore prices continue strong, with the market nominally around 52 to 53 cents on 50 to 52 per cent ore, for buyers of relatively small tonnage, and even as high as 56 cents has been reported asked recently. However, large tonnage buyers appear to be set to pay no more than 50 cents, if that, for nearby or 1938. As a matter of fact, there appears to be none available for nearby delivery. Tonnage buyers not only have ample material to meet requirements for the remainder of this year but for all of next year, if necessary.

One cause for hesitancy is the difference in price between some of the lower and higher grade ores. For instance, 45 per cent Chilean ore is available at around 40 cents per unit, ex-duty, as compared with asking prices of around 52 to 53 cents for 50 to 52 per cent material for Europe and Africa. This difference in price, some consumers point out, is too great for the difference in the unit content involved. There are also some offerings of 43 per cent manganese ore from Morocco at around 42 to 43 cents for shipment from October on into next year. However, in the case of this Moroccan ore and also Chilean ore, supplies are relatively limited.

Cleveland—The balance of iron ore on dock at Lake Erie ports Aug. 1, was approximately 160,000 tons less than on the comparable day a year ago, according to Lake Superior Iron Ore association.

Receipts of iron ore at lower lake ports this season to Aug. 1, shipments to interior furnaces and dock balances follow:

Port	Receipts Season	Shipments Season	Dock bal. Aug. 1, '37
Buffalo	2,955,043	404,643	3,844
Erie	1,393,028	1,358,263	86,460
Conneaut	5,195,015	5,180,632	1,271,259
Ashtabula	3,872,019	3,322,804	1,290,729
Fairport	1,143,296	1,136,723	406,575
Cleveland	5,279,036	3,999,625	540,432
Lorain	2,042,157	798,603	15,647
Huron	671,891	669,808	205,966
Toledo	1,090,244	593,388	30,504
Total	23,641,729	17,464,489	3,851,416
Yr. ago	12,406,570	10,161,180	4,016,613

Receipts at other than Lake Erie ports for July and the season to Aug. 1 follow:

Port	Month	Season
Detroit	154,269	514,789
Indiana Harbor	516,123	1,007,994
Gary	1,047,195	3,394,088
South Chicago	1,228,411	3,919,320
Sault Ste. Marie, Ont.	69,465	265,339
Hamilton, Ont.	101,577	319,448
Total	3,117,040	9,420,978
Year ago	2,146,656	5,496,115

Stocks of iron ore at the lower lakes ports and furnaces Aug. 1 were approximately 4,000,000 tons more than on the comparable date last year, due to the marked improvement in shipment from upper lake ports. The Lake Superior Iron Ore association reports:

	Tons
Consumed in June	4,639,733
Consumed in July	5,236,487
Increase in July	596,754
Consumed in July, 1936	3,826,050
On hand at furnaces Aug. 1	25,299,841
On Lake Erie docks Aug. 1	3,851,416
Total on hand at furnaces and Lake Erie docks Aug. 1	29,151,257
Reserves, total Aug. 1, 1936	25,210,593

Tin Plate

Tin Plate Prices, Page 78

Pittsburgh—Forging ahead at 100 per cent operations to clear books of tonnage due under the Sept. 30 price deadline, tin plate mills appear bent upon making all possible deliveries meanwhile. Slowing down of mill operation during recent labor troubles has thrown added burden currently upon the mills and beer can demand during the heated period again has demonstrated its possibility as an important consumer of tin plate. The price advance will take effect Oct. 1 and about a month later, as usual, the price will be announced for spring tin plate contracts.

New York—Most large canmakers have contract specifications for tin plate in producers' hands, but are pressing for deliveries. Certain of these buyers have enough in stock and under contract at $10 below the current market on new business to last them well over the remainder of this year, it is said.

Baltimore—With certain vegetable crops now being harvested in extra abundance, tin plate specifications continue heavy. Some trade interests estimate the average annual consumption of tin plate in the Baltimore district at 100,000 tons, and would not be surprised if this year's buying will run even heavier.

Steel In Europe

Foreign Steel Prices, Page 81

London—(*By Radio*)—Imports of steel and iron products into Great Britain in July totaled 202,283 gross tons, compared with 174,824 tons in June. This is the largest import total since February, 1932, and places the volume of imports at about the level of 1930 and 1931, before the world-wide depression in the steel industry. Exports of steel and iron products in July totaled 232,171 tons, compared with 235,412 tons in June, a decline of 3241 tons.

Pig iron output is practically all sold until December and current buying is limited. Some first quarter contracts have been entered at prices ruling at delivery. Exports are being limited to hematite iron. Increased imports of steel from the Continent have improved the semi-finished position. Demand for steel continues heavy and is being only partially satisfied. Such tonnage as is available for export is easily sold.

The Continent reports demand for

BISCO . . .
NON-SHRINK
OIL HARDENING
TOOL STEEL TUBING

Machine tool builders find this tubing excellent for vital parts where increased strength, rigidity and wear are important factors.

Bisco Tubing is also ideal in dies for punching, forming, and blanking operations. Any size can be supplied

Complete stocks of Boiler Tubing, Mechanical Tubing, and Aircraft Tubing ready for immediate shipment. We can also supply Stainless Steel Tubing in any analyses.

The BISSETT STEEL COMPANY
900 East 67th Street, Cleveland, Ohio
FINE TOOL STEELS • TUNGSTEN CARBIDE TOOLS, ETC.

export is at a satisfactory rate from various consuming countries.

Ferroalloys

Ferroalloy Prices, Page 80

New York—Ferromanganese shipments are expanding, as stocks laid in last June are being consumed and the trade in general is looking for higher prices for fourth quarter. However, with respect to the latter consideration nothing definite will likely be known until producers open their books around the middle of September. Meanwhile, the market continues steady at $102.50, duty paid, Atlantic and Gulf ports.

Domestic spiegeleisen, 19 to 21 per cent, is steady at $33, Palmerton, Pa., and 26 to 28 per cent material at $39. Higher prices for fourth quarter are regarded as probable, especially if there should be an advance in ferromanganese, as there is a close relationship usually in the trend of the two alloys.

Metallurgical Coke

Coke Prices, Page 79

Chicago—Foundry coke shipments continue heavier than a month ago though improvement in consumption is spotty. Jobbing plants generally are holding at the lower rates attained several weeks ago but some producers of automotive castings are slightly busier. The total melt shows a sizable gain compared with a year ago. Foundry coke continues $10.25, ovens, for outside delivery and $11, delivered Chicago.

Sino-Jap Hostilities Threaten Tungsten Ore

New York—Hostilities at Shanghai, threatening to interrupt commercial shipping from that port, are causing concern among tungsten ore buyers in this country.

So far, however, no delay in shipments has been noted in cable advices to importers here and while the Sino-Japanese situation in general has added buoyancy to the already strong market on tungsten ore, there have been no further price increases over the past few days.

At present the market is holding at about $23 to $25 per short ton unit, duty paid, for November and December delivery, with the general range of quotations nearer the outside figure.

In Europe, where sharp competition prevails among certain countries for tonnage to meet requirements of their armament programs, the market appears even stronger with as high as 82 shillings having recently been asked on the long ton basis, although no business has been reported at that figure.

Will We Export Iron Ore?

New York—Scarcity of foreign ore, combined with the continued strong market abroad, has given rise to speculation as to whether this country within the next year may become an exporter of iron ore.

Since the first of the year Lake Superior ore has come as far east as the seaboard for the first time since about 1929, for the account of eastern consuming plants. The further step to European points, consequently, looks less improbable than a few months ago, it is pointed out. The question is, will ore as a raw material eventually follow the trend in the movement of scrap. At present, trade leaders declare, it is too early to say.

Nonferrous Metals

Nonferrous Metal Prices, Page 80

New York—Activity in nonferrous metal markets settled to a slow pace last week following the period of heavy buying and rising prices earlier in the month. Export copper declined but domestic markets held steady.

Copper—Export copper closed lower at 14.00c, c.i.f., due to lack of consumer demand. Sales declined steadily here but electrolytic held at 14.00c, Connecticut.

Lead—Prices were firm at 6.35c, East St. Louis, on fair sales. Refined stocks declined during June to a new low since 1930.

Zinc—Prime western held at 7.25c, East St. Louis. Actual business was limited only by stringency of supplies.

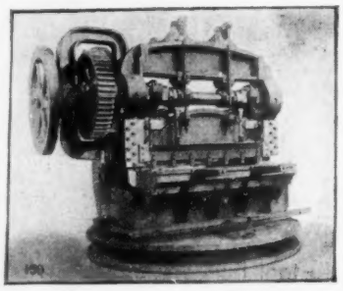
Tin—Straits spot held fairly steady within the range of 59.37½c to 59.62½c. Consumer interest picked up at the lower levels but sellers were reticent.

Antimony—Interests watched developments in the Far East but the Sino-Japanese hostilities have not affected the market materially. American spot held at 15.25c, New York, while Chinese spot advanced to 15.50c, duty paid New York, on Monday.

Equipment

Chicago — Machinery and equipment markets are quiet, particularly as regards inquiries. Bookings are fairly well sustained despite some decrease from the volume of earlier months, but inquiries are insufficient to offset items being closed. Current slowness is attributed almost entirely to the season. While most orders consist of only a few items, many inquiries involve larger machines. Small tools share in the lighter volume of sales.

Seattle—Business continues fair although some lines report a seasonal decline. Lumbering and road building activity is still strong while electrical equipment and pumping machinery are in good demand. Demand for mining items is less.

PRESSES • DIES • METAL-FORMING MACHINERY
FABRICATING MACHINERY
PUNCHES • SHEARS • SPACING TABLES
Plate Shears — for steel plants
● Leading steel plants all over the country use Thomas Plate Shears, appreciating that they DO stand up under toughest use day in and day out! The complete line of Thomas shears is sure to meet your every need. Write for information.

THOMAS
MACHINE MANUFACTURING COMPANY
Name changed from Thomas Spacing Machine Co.
PITTSBURGH, PA.
BENDING AND STRAIGHTENING MACHINES • MULTIPLE DRILLS

Construction and Enterprise

Ohio

COLUMBUS GROVE, O.—Village plans to install diesel power equipment in expansion of electric light and water plant. Cost of work will be around $50,000. Roy N. McCullough is mayor and Burns & McDonnell Engineering Co., 307 East Fourth street, Cincinnati, is engineer. (Noted STEEL, June 7 and Aug. 16.)

ELYRIA, O.—Couch-Uthe Co., Buckeye street, plans to build a 60 x 285-foot factory and office building on Olive street, for manufacturing screw machine products. Cost will be over $40,000.

HAMILTON, O.—Mokry & Tesmer Machine Co. has been incorporated by Robert C. Banker, George E. Zeckner and August Mokry.

IRONTON, O.—City is taking bids, due noon Aug. 31, for materials for waterworks improvements, including two 8-inch centrifugal pumps and motors and starters. Leonard G. Howell is city manager and Ackley, Bradley & Day, 508 Third street, Pittsburgh, are engineers.

JAMESTOWN, O.—Village is taking bids due Aug. 30 for water softening plant equipment. B. Elliden Bailey is mayor and engineer is Collins-Wight, Union Trust building, Dayton.

KIMBOLTON, O.—Village has selected Peter Sheehan, Cambridge, O., as engineer for proposed construction of waterworks plant. Maturity depends on WPA approval. L. C. Gibson is village clerk. (Noted STEEL, Aug. 9.)

MARION, O.—Erie Railroad Co., G. S. Fanning, chief engineer, Midland building, Cleveland, plans to build a new car yard costing $60,000.
ad PAC COAST

SANDUSKY, O.—Sandusky Foundry & Machine Co. plans to build a $60,000 addition to its machine shop.

TOLEDO, O.—City is taking bids due 2 p. m., Aug. 24, for a 50-kilowatt turbine generator and condensing equipment. D. E. A. Cameron is commissioner of purchases and supplies, 324 Safety building.

TOLEDO, O.—Mather Spring Co., Wolcott boulevard, will build a large branch plant at Linden, N. J., to include 60,000 square feet. Cost is estimated at more than $250,000. Gordon M. Mather is president. General contract has been awarded to A. Bentley & Sons Co., Toledo.

YOUNGSTOWN, O.—Buffalo Pressed Steel Co., Buffalo, N. Y., plans to build a plant costing $100,000. R. J. MacKenzie is president.

WARREN, O.—General Electric Co., J. E. Kewley, vice president, Nela Park, Cleveland, plans to build a factory on West Market street, for manufacturing automobile lamps. Estimated cost is $100,000.

Connecticut

NEW BRITAIN, CONN. — Landers, Frary & Clark, 47 Center street, has given general contract to A. F. Peaslee Inc., Hartford, for construction of a plant.

Massachusetts

FITCHBURG, MASS.—Simonds Saw & Steel Co., North street, plans to build a power house at plant and install two diesel engine generating units with auxiliaries. Francis J. Still, Westboro, Mass., is engineer.

SPRINGFIELD, MASS.—New York, New Haven & Hartford railroad, Water street, New Haven, Conn., plans to build a coaling station at Springfield, and will install conveying, loading and mechanical handling equipment. Estimated cost is $35,000. E. E. Oviatt is chief engineer.

New Jersey

BAYONNE, N. J.—International Nickel Co., 15 Oak street, plans to build a laboratory, foundry and storage building on Hobart avenue, at a cost of $100,000. Architect is Epple & Kahrs, 17 Washington street, Newark.

ELIZABETH, N. J.—Bradford Irving Co. Inc., care of B. H. Whinston, architect, 6 East Forty-sixth street, New York, plans to construct a group of 1-story buildings, 150 x 400 feet, 105 x 300 feet, and two 30 x 100 feet. Total cost will be about $500,000.

Michigan

ADRIAN, MICH.—Southeastern Michigan Rural Electric Co-operative Inc. plans to build a steam-electric generating plant to supply current for rural transmission lines in vicinity. Estimated cost is $250,000, to be met with federal aid.

GRAND RAPIDS, MICH.—Thomasma Bros. plans to construct a factory, for which W. Hosstra, Grand Rapids, has general contract. Pierre Lindhout, Grand Rapids, is architect.

DETROIT—Van Thompson Mfg. Co., 5915 Michigan avenue, has been incorporated to manufacture auto radio aerials and accessories.

IRON RIVER, MICH.—Marinette & Menominee Box Co., Marinette, Wis., Daniel Coffy, president, plans to build a factory for manufacturing wooden boxes.

LANSING, MICH.—Motor Wheel Corp. has broken ground for construction of two new factory buildings, one to be 150 x 325 feet, the other 160 x 300 feet. About 90,000 square feet of floor space will be added, at a cost of approximately $250,000. Reniger Construction Co., Lansing, has general contract.

MOUNT CLEMENS, MICH. — Mount Clemens Metal Products Co. Inc. has been organized to manufacture metal fastening devices for automotive manufacturers. Albert Glass, Mount Clemens, will be plant superintendent. Operations will be conducted in the Copony sign building, just south of the Mount Clemens Pottery plant.

ZEELAND, MICH.—Peter Brill Co., Zeeland, has been given general contract for construction of a municipal power plant, estimated to cost $85,000 with equipment.

Illinois

CHICAGO—J. R. McGregor Lead Co. plans to build a 1½-story, 150 x 250-foot plant at 4520 West Fifteenth street, at a cost of $90,000.

GRANDVIEW, ILL.—City will take bids soon for construction of a municipal water softening plant costing around $80,000. Consoer, Townsend & Quinlan, 205 West Wacker drive, Chicago, is architect.

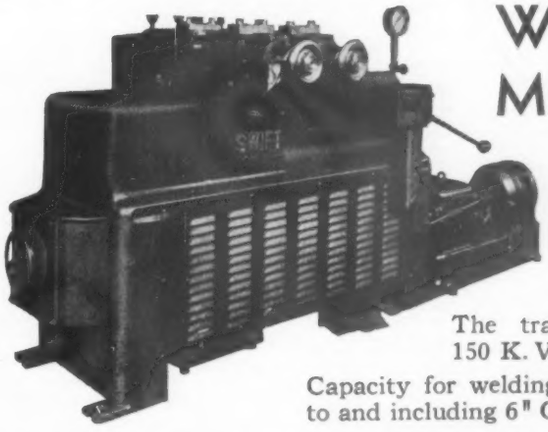
SPRINGFIELD, ILL.—City plans to build an addition to the municipal power plant at Lakeside, and will install an engine generator unit, boilers, etc., at a cost of over $400,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, is engineer.

Indiana

WARREN, IND.—Mid-West Packing Co. plans to build a manufacturing plant costing over $40,000.

WHITING, IND.—Standard Oil Co. of Indiana, 910 South Michigan avenue,

No. 35 Swift Flue & Pipe WELDING MACHINE



Hydraulically Operated

•

The transformer is rated 150 K. V. A. to 250 K. V. A.

Capacity for welding from 2" O. D. up to and including 6" O. D. flues and pipe.

SWIFT ELECTRIC WELDER COMPANY

6565 Epworth Boulevard, Detroit, Michigan

Welding machines which are hand, hydraulic, air or cam operated including the following types:

Spot, Seam, Projection, Flash, Flue, Gun Units and Special Heating Machines

Chicago, plans to build gasoline cracking units at its refinery. Cost will be around $3,000,000.

Maryland

POPES CREEK, MD.—Southern Maryland Tri-County Co-operative Association Inc., Wendell M. Reed, president, Welcome, Md., has applied to public service commission in Baltimore for permission to build a generating plant to house three diesel generators.

Georgia

SAVANNAH, GA.—Southern States Iron Roofing Co. plans to begin an expansion program soon. Leonard T. Beecher, 408 Tenth avenue West, Birmingham, recently acquired an interest in the company, and will be vice president and secretary-treasurer.

Florida

JACKSONVILLE, FLA.—International Harvester Co., 606 South Michigan boulevard, Chicago, has purchased a site and will construct a $300,000 plant. J. L. Moor is southeastern manager at Jacksonville.

JACKSONVILLE, FLA.—National Container Corp., Samuel Kipnis, president, Review avenue, Long Island City, N. Y., plans to build a plant for manufacturing corrugated paper shipping containers, an additional operation to the pulp and paper manufacturing plant now being built.

MIAMI, FLA.—Florida Natural Building Corp. plans to build a steam power station in a 16-story office building at Second avenue Northeast and First street. Estimated cost is $2,500,000. Marsh & Saxelbye, Hildebrandt building, Jacksonville, is architect.

Virginia

APPOMATTOX, VA.—City has plans to build a sewage disposal plant and distribution system costing $65,000, and has received approval from WPA. J. B. McCrary Co. Inc., 705 Rosenburg building, Roanoke, Va., is engineer.

LIVELY, VA.—Northern Neck Electric Co-operative has been authorized by state corporation commission to borrow $184,000 from REA for construction of a power station near Lively and for erection of rural transmission lines.

RURAL RETREAT, VA.—PWA has approved construction of a sewage disposal plant and distribution system, to cost $41,000. J. B. McCrary Co. Inc., 705 Rosenburg building, Roanoke, Va., is engineer.

WARSAW, VA.—North Neck Electric Co-operative Inc. plans to build a steam-electric generating plant to supply power for the rural transmission lines. A fund of $184,000 has been arranged with federal aid.

Missouri

JOPLIN, MO.—Rogers Iron Works Co., Eleventh street and Pearl avenue, recently began construction of a 35 x 50-foot addition to its foundry. Ozark Engineering Co. has general contract.

MOBERLY, MO.—Wabash Railroad Co., Railway Exchange building, St. Louis, plans to build a coaling station at Moberly, to cost $50,000. J. C. Bousfield is company engineer.

ST. LOUIS—Mechanics Iron Works, 628 Edmunds street, will take bids soon for construction of a 1-story, 50 x 250-foot plant addition. C. C. Ramming is in charge.

ST. LOUIS, MO.—Keasbey & Mattison Co., Ambler, Pa., plans to install conveyors, motors and controls, loaders, and other mechanical handling equipment in new plant at St. Louis for manufacturing asbestos products. Cost will be over $400,000.

ST. LOUIS, MO.—Anheuser-Busch Inc., 721 Pestalozzi street, will install motors and controls, electric hoists, loaders, conveyors, and other mechanical handling equipment in 8-story addition to storage stockhouse. Total estimated cost is $1,000,000.

WINDFIELD, MO.—City will take bids soon for construction of sewage disposal plant. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, is engineer.

Oklahoma

DEWEY, OKLA.—City plans to build a 100,000-gallon per day capacity filtration plant at a cost of over $30,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

MUSKOGEE, OKLA.—Pure Oil Co., 35 East Wacker drive, Chicago, has awarded the general contract for construction of a $1,000,000 cracking plant at Muskogee refinery. L. K. Wells, engineer for Trans-American Construction Co., 30 Church street, New York, will supervise construction.

PONCA CITY, OKLA. — Continental Oil Co. plans to build a casinghead gasoline plant in Billings field, Noble county, to process gas from various oil producers in field. Plant will cost $200,000, and have a daily capacity of 20,000,000 cubic feet.

Wisconsin

BRILLION, WIS.—Ariens Co., agricultural implement maker, plans to build a factory addition, 40 x 80 feet.

CHIPPEWA FALLS, WIS.—Chippewa Valley Co-operative plans to erect rural electric transmission lines, for which W. A. Patterson Co., St. Paul, is low bidder at $159,995. W. L. Graf, Cornell, Wis., is secretary.

HORICON, WIS.—Van Brunt Mfg. Co., maker of farm implements, is starting work on a gray iron foundry extension, 81 x 100 feet, to cost $30,000. F. H. Clauson is president.

KENOSHA, WIS.—Snap-On Tools Inc., Kenosha, has opened a branch factory in Mount Carmel, Ill., with 2500 square feet, in charge of William Enders, formerly superintendent of the main plant at Kenosha.

LA CROSSE, WIS.—Motor Meter Gauge & Equipment Corp. has given contract to the Austin Co. for construction of a 1-story factory addition to provide 30,000 additional square feet of floor space.

MADISON, WIS.—Ever-Flo Mfg. Co. has been incorporated to manufacture mechanical devices, by Earle S. Clauder and Dorothy and Floyd Gallagher.

MANITOWOC, WIS.—Wisconsin Malting Co., 759 North Milwaukee street, Milwaukee, plans to spend $300,000 or more to enlarge its malting plant in Manitowoc. Engineer is McKenzie-Hague Inc., Minneapolis.

MILWAUKEE—Nash-Kelvinator Corp. plans to build a factory addition on East Euclid avenue for manufacturing motor trucks.

MILWAUKEE — Pabst Brewing Co. plans to build a new plant on site of the former Atlas Flour Mills at North Commerce and West Cherry streets, at a cost of $100,000.

NEENAH, WIS.—Neenah Foundry Co., maker of sewer castings and manhole covers, will build a 60 x 60-foot, 1-story foundry addition; general contract to Fluor Brothers Construction Co., Oshkosh, Wis.

RICE LAKE, WIS.—Ernest Burnett Box Co. plans to rebuild its box manufacturing plant which was recently damaged by fire.

SHEBOYGAN, WIS. — Sheboygan Foundry Co. will build a shop addition, 50 x 80 feet. Architects are Statre & Senescall, Sheboygan.

TWO RIVERS, WIS.—Schwartz Mfg. Co., manufacturer of buffing wheels and filtering products, has started construction of a 1-story plant addition, 24 x 78 feet.

WAUKESHA, WIS.—Spring City Foundry Co., gray iron castings, plans to build a new core room and pattern storage additions. W. J. Grede, 6432 West State street, Milwaukee, is president.

WAUKESHA, WIS.—Waukesha Motor Co. plans to expand manufacturing facilities in its refrigeration equipment division, where it makes ice engines for railroad coaches and commercial and domestic air-conditioning units.

Minnesota

BEMIDJI, MINN.—City council will take bids until Aug. 30 for construction of a municipal light and power plant. Belle Denley is city clerk, and Rose & Harris, Essex building, Minneapolis, are engineers.

FARMINGTON, MINN.—Independent Utility Co., P. C. Records, president, plans to construct a power plant and distribution system costing $120,000. Buell & Winter, 508 Insurance building, Sioux City, Iowa, is engineer.

LAKE CRYSTAL, MINN.—City council will take bids until Aug. 31 for construction of a municipal light and power plant, electrical distribution system and for diesel engine generating equipment with auxiliaries. J. T. Wiger is city clerk, and G. M. Orr & Co., Baker Arcade building, Minneapolis, is engineer.

WACONIA, MINN.—Carver County Co-operative Electric association has been allotted $100,000 by REA for erection of 143 miles of rural transmission lines.

Texas

AMARILLO, TEX.—Stanley Marsh Jr. has been granted permission to build a carbon black plant in Texas county, Okla.

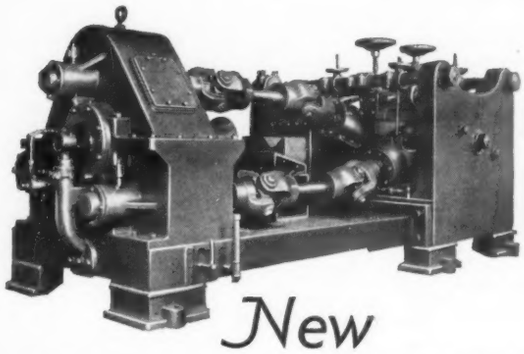
ALBANY, TEX.—Roeser & Pendleton, Fort Worth Club building, Fort Worth, plans construction of a power house and compressor station at its natural gas plant near Albany. Engine and compressor units will be installed to handle 2,000,000 cubic feet of gas per day. Estimated cost is $100,000. P. W. Armstrong is plant engineer.

CORPUS CHRISTI, TEX. — E. L. Buckley & Associates, Corpus Christi, and Bedell building, San Antonio, plan to build a refinery or skimming plant costing $600,000.

DALLAS, TEX.—East Texas Refining Co., Tower Petroleum building, plans to construct a natural gas plant in Miller county, Ark. Freeman W. Burford is president.

HUGHES SPRING, TEX.—City will receive bids Sept. 2 for construction of a water treatment plant. J. T. Harris is mayor and H. L. Thackwell, Longview, Tex., is engineer. (Noted Steel Aug. 16.)

PLEASANTON, TEX.—City will ask



New

CONTINUOUS AUTOMATIC STRAIGHTENING *and* POLISHING Bar, Tube *and* Wire Machines

Combine all the necessary features of Speed, Precision, Capacity and Safety... Steel rolls set in Medart-Timken Bearings...Driving gears completely enclosed...Also Continuous Automatic Centerless Round Bar and Tube Turners, built in several types.

THE MEDART COMPANY • *General Offices and Works:* 3520 De Kalb St., St. Louis, Mo.

MEDART

M·D·Hubbard Spring Company

613 CENTRAL AVE., PONTIAC, MICH.

Producer Gas Systems

WE GUARANTEE RESULTS

Using Bituminous and Anthracite Coal, Raw and Scrubbed Gas, for Displacing Oil, City and Natural Gas Coal and Coke furnaces of all descriptions.

Flinn & Dreffein Co.

308 W. Washington St. Chicago, Ill.

H. A. BRASSERT & CO.

CONSULTING ENGINEEERS

for Iron, Steel, Fuel and Heavy Metallurgical Industries.
PROJECTS, PLANT DESIGN, CONSTRUCTION OPERATION, MARKETS, FINANCE AND MANAGEMENT

310 South Michigan Ave. Chicago, Ill.

HOLCROFT & COMPANY

LEADERS IN BUILDING AND DESIGNING ELECTRIC AND COMBUSTION FURNACES, KILNS AND OVENS.
HOME OFFICE: DETROIT—BRANCHES: CHICAGO, PHILADELPHIA
CANADA: WALKER METAL PRODUCTS, LTD. WALKERVILLE, ONT.

BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

INDUSTRIAL FURNACES

OVENS and DRYERS
BURNER EQUIPMENT

PENNSYLVANIA INDUSTRIAL ENGINEERS

2413 W. Magnolia St., N. S., Pittsburgh, Pa.

SC&H Furnaces are made for annealing, case hardening, carburizing, forging, cyaniding, lead hardening & oil tempering.

STRONG CARLISLE & HAMMOND

1400 W. 3rd St., Cleveland, O.

SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.

Pickling of Iron and Steel—*By Wallace G. Imhoff*

This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.

Price Postpaid $5.15 (25s.6d.)

THE PENTON PUBLISHING CO.
Book Department
1213 W. 3rd St. Cleveland, O.

520-S.

LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS

OHIO

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

bids soon for waterworks improvements to cost $40,000. Garrett Engineering Co., box 1726, Houston, is engineer.

Kansas

HAYS, KANS.—Central Kansas Power Co., Abilene, Kans., has authorized construction of a steam-electric generating plant at Hays, and equipment will be installed. Work will begin soon.

PITTSBURGH, KANS.—McNally Pittsburgh Mfg. Co. plans to build a plant addition costing $50,000. C. B. Manning, Joplin, Mo., is engineer.

WASHINGTON, KANS.—City will take bids until 3 p. m., Sept. 1, for furnishing and installing a new diesel engine in its municipal light plant. A. N. Halloway is mayor. E. T. Archer & Co., 609 New England building, Kansas City, Mo., is engineer.

Iowa

GREENFIELD, IOWA—Town council will take bids until Sept. 3 for construction of a municipal light and power plant and installation of a 4-cycle diesel engine with auxiliary equipment. C. L. Downing is town clerk.

PERRY, IOWA—City plans to build sewage disposal plant costing about $100,000. Buell & Winter, 506 Insurance Exchange building, Sioux City, is engineer.

ROCKWELL CITY, IOWA—City is taking bids for installation of three 900-horsepower diesel generating units with accessories, oil tanks, cooling towers and auxiliary equipment. Estimated cost is $175,000. Young & Stanley Inc., Muscatine, Iowa, is engineer.

WATERLOO, IOWA—Manning Pattern Co. plans to build a 1-story plant addition.

Nebraska

CENTRAL CITY, NEBR. — Merrick County Rural Public Power district plans to erect approximately 215 miles of rural transmission lines costing $215,737. Midwestern Engineering Co., Hastings, Nebr., is engineer.

WEST POINT, NEBR.—Cuming County Rural Public Power district has received a loan from REA of $250,000, for erection of 400 miles of rural transmission lines. Midwestern Engineering Co., Hastings, Nebr., is engineer.

WESTON, NEBR.—Norris Rural Public Power district, R. N. McCord, president, Fairbury, Nebr., has received a loan from REA of $150,000, to finance erection of 291 miles of rural transmission lines. H. A. Davis, Crete, Nebr., is engineer.

Colorado

GREELEY, COL.—Home Gas & Electric Co. plans to build a power substation costing around $85,000, to include installation of transformers, switchgear, and auxiliary equipment. An extension will be made in transmission lines in the vicinity. Total cost will be approximately $170,000. Work will begin soon.

LA JUNTA, COL.—City plans to build a municipal electric plant costing over $100,000. Bonds will be issued soon.

Wyoming

LARAMIE, WYO.—City plans to build a pumping plant and water treatment plant on the Laramie river, to cost $350,000. E. K. Nelson is city engineer, and Black & Veatch, 4706 Broadway, Kansas City, are engineers.

LINGLE, WYO.—Wyoming Rural Electric Co. has received an REA allotment of $156,000 for erection of 150 miles of rural lines in Goshen county. Phil L. Rouse, Torrington, Wyo., is engineer.

Idaho

LEWISTON, IDAHO—Clearwater Valley Light & Power Association Inc. plans to build a steam-electric generating plant in Latah county, to cost $75,000, with federal aid.

OROFINO, IDAHO—City plans to install a motor driven pumping unit in municipal waterworks plant. Estimated cost is $30,000.

TROY, IDAHO—Ray Branch is rebuilding his planing mill, which was recently damaged by fire. New machinery, including a diesel engine, will be installed.

Arizona

ROOSEVELT, ARIZ.—Roosevelt water conservation district plans to build a hydroelectric project at the junction of the Salt and Verde river, 30 miles east of Phoenix. A power dam, generating station with capacity of 7000 horsepower, power substation, and switching plant will be constructed. Estimated cost is $2,500,000. Federal aid will be sought in financing.

New Mexico

HURLEY, N. M.—Nevada Consolidated Copper Corp., subsidiary of Kennecott Copper Corp., 120 Broadway, New York, plans to install motors and controls, conveyors, electric hoists and other mechanical handling equipment in new smelting plant at Hurley, estimated to cost $5,000,000. (Noted STEEL, Aug. 16.)

Pacific Coast

LONG BEACH, CALIF. — Procter & Gamble, Cincinnati, will build a $1,000,000 addition to its factory at Long Beach. Plans have been completed.

LOS ANGELES—Southern California Gas Co., 810 South Flower street, plans to build a 1-story, 48 x 60-foot mechanical blower station on South Raymond avenue, at a cost of $50,000.

LOS ANGELES—Armstrong Cork Co. of California, subsidiary of Armstrong Cork Co., Lancaster, Pa., has purchased a 26-acre site in South Gate and will build a $1,000,000 manufacturing plant.

LOS ANGELES—Richfield Oil Co. plans to build new refinery facilities at Watson, in the Los Angeles harbor district, at a total cost exceeding $4,000,000.

SAN FRANCISCO—Greenberg Sons, 765 Folsom street, plan to build a 3-story, 80 x 145-foot factory on Folsom near Fourth street. Bids will be asked soon by Hyman & Appleton, architects, 68 Post street.

ASTORIA, WASH.—Pilchard reduction plant of Pacific Marine Products Co. was damaged by fire Aug. 10, and may be rebuilt.

DAYTON, WASH.—City officials have been ordered by superior court to proceed with construction of a sewage disposal plant, following hearing on suit to halt work.

EVERETT, WASH. — Weyerhaeuser Timber Co. is installing machinery at its plant. Estimated total cost of equipment needed is $100,000.

SEATTLE—City lighting department will take bids until Sept. 2 for construction of a switchboard building at the south substation for which $120,000 is available.

WALLA WALLA, WASH.—Progressive Machinery Co. has been incorporated by Wallace Young and associates, 410 Baker building.

KLAMATH FALLS, OREG.—Enterprise irrigation district plans to issue $40,000 bonds for construction of a power plant at the Klamath Falls reclamation project. PWA has granted $28,636.

Canada

LATUQUE, QUE.—St. Maurice Power Corp. Ltd., is planning a 160,000-horsepower hydroelectric development on the upper St. Maurice river. Six vertical hydroelectric units of 40,500-horsepower capacity each will be installed. Cost will be around $15,000,000.

South's New Tin Plate Mills Taking Shape

RAPID progress on the Tennessee Coal, Iron & Railroad Co.'s new project in Birmingham, Ala., assures completion on schedule early next year. Mills will employ 2500 men and have annual capacity of 200,000 gross tons of finished tin plate. The five buildings shown in the background will house shearing units, the North cold reduction room, tempering mills and cold reduction mills, the South cold reduction room, and the annealing department. Tinning units, assorting room, warehouse, box house and loading deck will be located in foreground. Photo courtesy US Steel News

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Housing Study Essential

To the Editor:

Reading in STEEL, Aug. 2, page 33, that the bureau of standards has started studies of low-cost housing, we are much interested, as this company is in the midst of exhaustive studies to the same end, but which have not progressed sufficiently to allow any conclusions.

We feel that complete studies of this type are vitally necessary and will be of considerable service, not only to the steel industry, but to everyone else interested in houses of this type. We intend to co-operate with the bureau of standards in this matter.

DEXTER W. JOHNSON
Great Lakes Steel Corp.,
Stran-Steel division,
Detroit.

Salesman a Co-ordinator

To the Editor:

Mr. Stilwell's article in STEEL Aug. 2 describes a condition which I believe exists today in every progressive machine tool plant.

The product manufacturer wants better production and better product at lower cost, dependable machine tools and efficient service. The machine tool manufacturer wants to make them for him.

The sales and purchasing departments of seller and buyer are the natural links to bring about the desired end. Today, the men in these departments have had experience in various branches of their concerns that fits them for their present important work. They handle not only sales and purchases but complaints and suggestions, and are the medium through which go the latest ideas of the machine tool manufacturer and bring back to his company the desires and needs of customers. The salesman is not only the co-ordinator between his company and his customer, but for the engineering, production, inspection, and credit departments in his own company.

In this company, all customers' complaints and suggestions and all demonstration and service reports are cleared through the general sales office. All of these are brought to the direct personal attention of heads of various departments and are not filed until proper action has been taken.

W. P. KIRK
Sales Manager, Machinery Division,
Pratt & Whitney,
Hartford, Conn.

What Causes Unemployment?

To the Editor:

It would seem that the suggestion by the National Association of Manufacturers that the proposed census of unemployment record the causes of idleness, as reported in STEEL, Aug. 23, page 33, is pertinent and such information would be of more value than the simple enumeration of the number out of work.

All through the period that relief has been a major item in government expenditure it has been felt that thousands of persons on the rolls were not bona fide workers but to a great extent those who had not been employed previously and were taking advantage of the opportunity to obtain a slice of easy money.

The opinion is growing, however, that provisions of the bill as it passed congress will not bring such returns as would be of much value to industry in determining basic facts as to causes of unemployment.

INDUSTRIALIST
Buffalo.

Money in Salesmen's Reports

To the Editor:

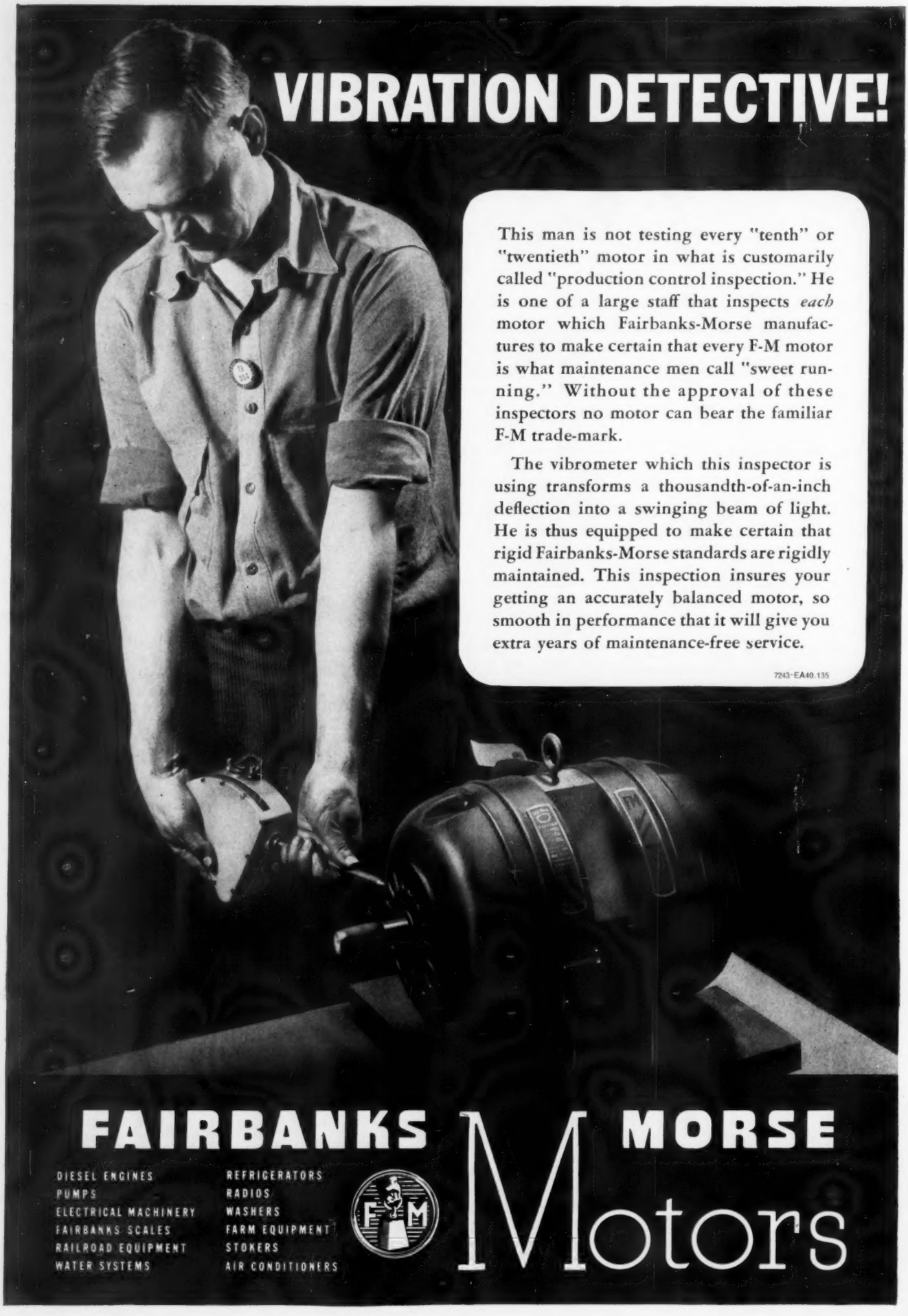
I thoroughly enjoyed the article entitled "Co-ordinating Sales with Production" by Mr. Stilwell which appeared in the Aug. 2 issue of your magazine. Furthermore, I agree with the excellent suggestions which were offered in that thoughtful article.

It is, of course, always surprising to read something that should be obvious to any executive who is connected with the manufacturing and selling of industrial equipment. It is true that the sales manager should endeavor to co-ordinate sales with production. I am of the opinion however, that the salesmen if properly handled will force the sales manager to take the steps suggested by Mr. Stilwell.

I have been more or less amazed at times to learn of many companies who do not require their salesmen and their service men to send in each day, reports covering their calls upon the trade. Some sales managers have informed me that it is unfair to burden their salesmen with the work required in writing reports at the end of a day spent in visiting customers and prospects. Other sales managers have expressed so much confidence in their men having their territories well in hand that they do not think that reports covering individual calls are at all required.

We insist upon daily reports covering calls made by the representatives in both our sales and service departments. We demand this not to check on the activity of any particular representative nor with the idea of putting an undue burden on them. We request reports simply because we, in the home office will obtain some ideas of conditions gen-

(Please turn to Page 64)


VIBRATION DETECTIVE!
This man is not testing every "tenth" or "twentieth" motor in what is customarily called "production control inspection." He is one of a large staff that inspects *each* motor which Fairbanks-Morse manufactures to make certain that every F-M motor is what maintenance men call "sweet running." Without the approval of these inspectors no motor can bear the familiar F-M trade-mark.
The vibrometer which this inspector is using transforms a thousandth-of-an-inch deflection into a swinging beam of light. He is thus equipped to make certain that rigid Fairbanks-Morse standards are rigidly maintained. This inspection insures your getting an accurately balanced motor, so smooth in performance that it will give you extra years of maintenance-free service.
7243-EA40.135
FAIRBANKS MORSE
DIESEL ENGINES
PUMPS
ELECTRICAL MACHINERY
FAIRBANKS SCALES
RAILROAD EQUIPMENT
WATER SYSTEMS
REFRIGERATORS
RADIOS
WASHERS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
F M
Motors